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NO. 30

LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interest of Lake Carriers, and improve the character of the service rendered to the public.

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CUBAN IRON ORE.

The second cargo of iron ore from the Spanish-American Iron Co.'s mines at Santiago de Cuba, was recently unloaded at Philadelphia from the steamer Edenmore. Oglebay, Norton & Co., of Cleveland, are the sales agents for this ore. The analysis of samples from the first cargo, made by Philadelphia chemists, showed iron 63.15, sulphur .049, phosphorus .033, moisture .74. The Spanish-American is a hard ore similar in appearance to the well known hard ores of the Marquette and Vermillion ranges. Some sales have been made to eastern furnaces, and it is expected that in the next few months shipments will be made at the rate of one or two cargoes a week. It is recent practice with a few eastern Pennsylvania furnaces to use Mesaba ores along with Cuban ores—25 per cent. of the former to 75 per cent. of the latter.

THE RECORD is indebted to the *American Shipbuilder*, of New York, for the illustrations of the hull and machinery of the steamship Howard, which appeared in last week's issue.

BUILDING PONTOON DREDGE BOATS.

In April last the Springfield Boiler & Mfg. Co., of Springfield, Ill., secured from Linden W. Bates the contract for constructing 40 pontoon dredge boats to be made of boiler iron—each one 50 feet long—making in all 2,000 feet. Mr. Linden is one of the largest dredging contractors in the world, says the *Iron Age*, and has successfully carried out a large contract in the construction of the Chicago drainage canal. He is now working for the government and will clear the Ohio and Mississippi Rivers of obstructions that have been a menace to the commerce of these streams. Though only receiving the contract in April and promising to have the work completed August 1, and the boiler works have pushed the construction, and all the pontoons will be done and on the water at Cairo, Ill., probably by the middle of July. The pontoons are arranged at the ends so that they can be easily connected, and when complete will form a floating bridge or boat 2,000 feet long. The pontoons are concave in structure and each one is seven feet across the top. Inside of this is an inner work, like the outside, but considerably smaller, being only about 33 inches across the top, and leaving 30 inches on either side for air chambers, the space between the outer and the inner concaves being divided into air chambers, of which there are four in each 50-foot length of pontoon.

This leaves a hollow concave groove in the top of each pontoon exactly 33 inches in depth, and in this will be laid a large pipe, made also of boiler iron, which forms a continuous tube the entire 2,000 feet of the complete pontoon. When the entire float is in the river a steam dredge having a revolving screw of large proportions works constantly cutting away obstructions in the river bed. This refuse is then forced in a continuous stream through the 33-inch pipe, and is deposited at will in a deeper part of the river dredged or on the banks.

CLAM SHELL SCOOPS A SUCCESS.

Coalmen at the head of the lake and elsewhere are watching with interest the operation of the new coal dock of the Lehigh Valley Coal Co. in Duluth. Gradually the working of the machinery is being brought down to perfection though several slight changes are contemplated before the best possible results can be obtained.

The best record which the dock has made thus far is a splendid one, but the management expects to do better. A coal cargo has been discharged at this dock with two derricks and each of the derricks averaged during the actual working time 63 tons per hour. When the third derrick is put in operation and a few changes and improvements have been made 2,000 tons will be unloaded in 10 hours, according to their figuring.

One of the disadvantages which the Bogle clam shell scoops labor under frequently is the small size of the vessels hatches. This difficulty is also augmented occasionally by a between deck in the vessel. The clam shells are of large size and will hold, when well filled, two tons each. If the hatches of a vessel are small it is

necessary for a man to stand on deck to guide the great bucket carefully into the hold and again out of the hold when it rises with a load. A loss of time results in this manner as the hoister has to slow down the machinery.

Another thing which interferes with making the best possible time for a continuous period of unloading coal is the fact that the hoisters are inexperienced men and it will take a month or six weeks to make them experts at the work or even fairly so.

COST OF THE NICARAUGUA CANAL.

Advices from Nicaragua state that the U. S. commission, which has been in that country for several weeks, will present a favorable report to the U. S. Government.

The commission has thoroughly examined the proposed canal route, and the Atlantic and Pacific terminals. They will recommend that a small breakwater be erected at the entrance to Greytown harbor, which will prevent the reformation of the Columbia shoal.

A slight change in the proposed route of the canal will be recommended, owing to the belief on the part of the commissioners that several serious obstacles exist on the route as heretofore laid down. The commissioners think that the work of constructing the canal can be completed in six or seven years, but that the total cost will considerably exceed the limit set by the projectors, and that \$110,000,000 will not be an excessive figure. The commission will ventilate its opinion of the former management of the canal enterprise, and will present a number of severe criticisms in this connection.

THE NEW NAVAL REGISTER.

The new U. S. Navy Register gives the records and stations of 1,641 officers, corrected to July 1. The officers of the line include 6 rear admirals, 10 commodores, 45 captains, 85 commanders, 74 lieutenant commanders, 250 lieutenants, 75 lieutenants, junior grade, and 181 ensigns. There are 157 officers and 13 vacancies in the medical corps; the pay corps has 95 officers and 1 vacancy, and the engineers corps has 177 officers and 25 cadets who have completed their four years' course at the Naval Academy and are available for all probable vacancies. The chaplains number 24, the professors and civil engineers 12 each and the naval constructors 32. The total number of line officers is 726, of staff officers 409, and of warrant officers 150, the latter including boatswains, gunners, carpenters, sailmakers and mates. There are 76 officers in the marine corps, 195 cadets at the Naval Academy, and 60 graduate cadets now serving the probationary term of two years before reaching commissions. There are 139 officers employed on special service, including 22 with the light-house board, 37 with the coast survey and 4 attaches to American embassies. The register shows that 88 naval vessels are in use, in addition to 6 unserviceables, and that 19 are at present under construction, several of the latter being practically ready for commissioning.

ALL Charts and Sailing Directions published by the Hydrographic Office, can be procured at the office of THE MARINE RECORD, 144 Superior street, Cleveland, O.

NEWS AROUND THE LAKES.

CLEVELAND.

Special Correspondence to The Marine Record.

The Globe Iron Works Co. have issued neat invitations to the launch of the steel schooner Tyrone Saturday afternoon.

Some parts of the wrecked St. Magnus are reported to be lying on the bottom of the main river close to the custom house pier, a menace to vessels landing there.

The work of dismantling the abandoned Cleveland beacon light at the corner of Water and Main streets, is almost finished. The lantern and iron stairway are being transferred to the new light-house at Braddock's Point, on Lake Ontario.

The Cuddy-Mullen dock on the lake front east of the river is nearing completion. The Pennsylvania Co. has begun the construction of an embryo dock just east of the Cuddy-Mullen dock, to serve as a protection. This dock consists only of a couple of rows of piling, but will be completed next year, or as soon as anybody wants to lease it.

The Cleveland & Buffalo Transit Co. expect to make extensive alterations on the steamer State of Ohio next winter. Her paddles will probably be steel, and the Howden hot draft system put in, increasing her speed about two miles per hour. The water supply pipes and plumbing will be entirely renewed. The staterooms are to be entirely overhauled and refurnished and their arrangement somewhat altered. New carpets and draperies will complete the fitout. The Ohio will then keep up her end of the route in good style with the new steamer next season.

CHICAGO.

Special Correspondence to The Marine Record.

Capt. J. S. Lawton, arrived at South Chicago, Tuesday morning and took charge of the steamer Egyptian. She will go in the ore trade.

The old schooner Norman was sold at United States' marshal's sale last week. George B. Carpenter & Co. were the purchasers for \$240.

The steamer Emma E. Thompson was knocked down at United States Marshal's sale last week to J. B. Hassett, of Chicago for \$3,000. Mr. Hassett disclaimed having authorized the purchase, and refused to pay the marshal the amount of his bid. The steamer will probably be sold again.

The steamer Egyptian, for which J. J. Warde paid \$48,000 about a year ago and since rebuilt at a cost of \$20,000 was sold last week by the United States Marshal for \$7,500. She was purchased by George R. Teller, of Buffalo, for the H. J. Winslow estate which held a mortgage on her for \$37,000.

The steamer Edward Buckley, Capt. Chas. Greenwich, recently made the run between Chicago and Manistee in 13 hours and 45 minutes. The masters of other lumber-carrying steamers claim to have made the run in the same or less time. Capt. Greenwich would like to fall in with some of them and give them a try.

Chas. P. Willard & Co., yacht brokers, sold on July 18 to Mr. Fred. W. Morgan, the well known pneumatic tire manufacturer, the steam yacht Hinda. The Hinda is a composite built boat, having steel frames and deck beams and southern pine planking. She was built in Baltimore in 1886, is fitted with a water-tube boiler, fore-and-aft compound engines and she turns up a 5-foot wheel. She will be used by Mr. Morgan for cruising on the lakes and her hailing port will be Chicago.

The membership of Chicago Harbor No. 33, of the American Association of Masters and Pilots of steam vessels is increasing rapidly. The following have become members during the present month: Captains J. Talbot, James E. Shea, Henry Neubert, Peter Barry, William Smith and A. J. Moffatt. Two new harbors have been added to the association this month, at Savannah and Brunswick, Ga. The association now numbers thirty-eight harbors.

P. H. Fleming & Co. have chartered the City of Berlin for 150,000 bushels of oats to Buffalo at 1c. C. W. Elphicke & Co., chartered the J. J. Hill for 50,000 bushels of wheat to Toledo at 1½c. and the C. P. Minch and F. W. Gifford for iron ore Escanaba to Buffalo at 80c. Carr & Blair chartered the Progress and John F. Eddy for oats to Buffalo at 1c., the W. H. Gratewick for wheat to Toledo at 1½c., the Frank

Leighton for maple lumber, Traverse City to Chicago at \$1.25 per 1,000. John Prindiville chartered the Canisteo, Stewart and Pomeroy for wheat to Toledo at 1½c. J. G. Keith & Co. chartered the Charles Stewart Parnell for oats to Buffalo at 1c. and the Mary McGregor for wheat to Port Huron at 1½c.

Maj. W. L. Marshall has made his report to the chief of engineers in Chicago harbor, all the work contemplated has been completed except the dredging of the outer basin, which was stopped some years ago because of litigation. Since work was suspended there has collected material amounting to 500,000 cubic yards to be removed to attain 16 feet depth. If the filling directed by the city of Chicago should be authorized by the Secretary of war, but as the utility of the work for federal purposes is not clear, no project looking to it is presented. Referring to the repairs on the exterior brakewater proper, Maj. Marshall says: "Although it was estimated that it would cost \$75,000, the contract prices gives but \$56,528. The work is not progressing satisfactorily, as is usual in unprofitable contracts." The mouth of Chicago river is equal in capacity to the passage over the crowns of the tunnels, and that if the \$25,000 appropriated for this purpose were used it could only be employed advantageously in removing tunnels and bridges necessary to the daily business of the city.

DETROIT.

Special Correspondence to The Marine Record.

Low water again occasions trouble at Grosse Pointe. The D. & C. Co. is fitting all of its big steamers with powerful search lights.

The Wyandotte Boat Co., has begun the delivery of some of its surf boats to the government, at Buffalo, according to contract.

Slack & Pringle have purchased the tug Sigison from the Thunder Bay Boom Co., of Alpena. The Sigison was recently rebuilt and is in good shape.

Five students of the engineering department of the Michigan Agricultural College, escorted by Prof. Weil, have been taking a trip down Lake Erie on the Rappahannock, in order to study the practical working of marine machinery.

The Canadian Pacific steamer Alberta may touch at Detroit to take on passengers. Detroit people who have been boarding her at Windsor have been subjected to annoying delays by the examination of their baggage by Windsor customs officials, which can be avoided if they get on board here.

BUFFALO.

Special Correspondence to The Marine Record.

The schooner Penokee was libeled last Saturday on a claim of \$60 presented by D. Provost & Son, but was released on Monday.

A bad bar has formed again at the entrance to Dunkirk harbor. The barge Reed stuck and found only 9 feet of water over the bar.

The proper disposal and arrangement of the dock space at the foot of Front street and Porter avenue is still the live subject in local circles. A new plan is presented every few days.

A rather unique suit has been brought against the New York Central by the Alexandria Bay (Thousand Islands) Steamboat Co., which wants \$25,000 damages, charging that the Central has been unfairly diverting business to other lines.

LORAIN.

Special Correspondence to The Marine Record.

The largest boats on the lakes can now wind in the river above Erie avenue bridge.

It is claimed that the C. L. & W. dock improvements here this season will cost \$200,000.

Master Car Builder F. H. Stark has completed specifications for a standard 30-ton coal car, and bids for these will be returned soon. Some of the cars will be in service, it is expected, long before navigation closes.

MILWAUKEE.

Special Correspondence to The Marine Record.

The Board of Tax Review is inclined to dispute the constitutionality of the vessel tax law passed last winter, assessing floating property according to tonnage instead of valuation. The board has asked City Attorney Hamilton for an opinion on the subject.

Coal receipts at Milwaukee are decreasing. Only 16 boats arrived with coal aggregating 27,400 tons, against 43,000 tons the week previous, and 40,530 tons for the corresponding week of 1894.

The tug Knight Templar had her cabin injured and her stock broken by collision with the Grand Avenue bridge last week, the electrical machinery of the bridge failing to work.

The city council is considering the advisability of erecting a new bridge at Huron street.

The Goodrich and Huron lines are carrying on their passenger rate war, with an occasional race between the Nyack and the Indiana and Wisconsin.

ASHTABULA.

Special Correspondence to The Marine Record.

A terrible death overtook Ray Marquette, first mate on the steamer F. L. Vance Tuesday noon. He was passing across the tracks between two cars, which were just then pushed together by a yard engine, Marquette being fatally crushed. He was a brother of Capt. E. B. Marquette, of the Vance. His remains were taken to the family home at Cheboygan, Mich., for burial.

The car dumping machine which the Brown Hoist Co. is building for the P. F. & N. Dock Co., at Fairport, is almost finished. It will cost \$65,000.

The Minnesota Dock Co. is considering the advisability of using the west side of the lake front slip for the unloading and storage of ore. The available room at this port is being badly crowded this season, notwithstanding the large amounts unloaded directly into cars.

There has been a little trouble reported on account of shallows in the city portion of the harbor.

John Collins, deck hand on the St. Paul, fell into the hold Sunday, and now lies at the Marine Hospital with a badly injured spine.

DULUTH AND SUPERIOR.

Special Correspondence to The Marine Record.

Capt. Singer has added to his line the tug Medina, which he bought from Capt. Barker, of Ashland.

The second of the two Standard Oil barges got away from the American Steel Barge Co.'s yard Sunday.

The new tug B. B. Inman is in commission, with Fred Benom as captain, and Charles Maples as engineer.

Daniel McDonald, a dock laborer, libeled the Porter Chamberlain Monday, on a \$1,000 claim for personal damages, alleged to have been received June 15, by a falling derrick. The boat was bonded.

The assignment of errors in the case of Alfred Merritt vs. John D. Rockefeller, in which Merritt obtained a verdict of nearly \$1,000,000, has been filed in the United States court. There are 165 errors alleged.

If the miners' strike does not extend to the near-by ranges, the shipments of Mahoning ore will be increased very considerably. The entire season's shipments from June 1, when they began, are estimated at 250,000 tons.

Last Thursday morning Deputy United States Marshal Cutting sold the schooner Emilia to satisfy a libel imposed by several of her crew. The boat was bid in by H. A. Gallagher for \$50. The amount of the libel was something over \$450.

The rough weather last Thursday kept a number of big boats in port, and there was some surprise when ex-Governor S. S. Field, of Ashland, came in on his little yacht Stella, with his wife, son, two daughters and two other young Ashland ladies. They had come from Isle Royale and had had a rough time of it. The yawl boat was carried away and several cabin windows were smashed. Gov. Field remained at the helm for eighteen hours at a stretch.

SANDUSKY.

Special Correspondence to The Marine Record.

The steamer Roby was loaded with 2,000 tons of coal in less than ten hours at the Short Line dock last Friday.

Capt. Fox, of the F. E. Kirby, reported the other day that the tow line of the Viking had picked up a large anchor in St. Clair River, and the anchor was dangling from the line as it passed through Detroit River.

The water at Middle Bass Island is 18 inches lower than last year, and it is hard to make a landing.

COUPLING BOILERS OF DIFFERENT SYSTEMS.

The following is from a paper read by M. Pierre Sigaudy, Engineer-in-Chief of the Societe des Forges et des Chantiers de la Mediterranee, at the Paris meeting of the Institution of Naval Architects:

Although water-tube boilers may offer great advantages, they do not seem to many people trustworthy enough to be exclusively employed in a great number of cases. The plainest manner to convince those that are frightened is, I think, to fit effectually together the old and new system of boilers on the same ship, thus giving the possibility of getting up steam quickly, which is generally of great importance. This idea has been treated lately by *Engineering*, with a view to navy use; and it is no longer a mere project, as a trial has recently been made successfully by the Societe des Forges et Chantiers, at Havre, on the tug boat Adour No. 3, built two months ago for the Chambre de Commerce of Bayonne. In this boat steam was produced by two boilers of quite different systems—one boiler being of the common return-tube type, and the other a water-tube boiler of the Normand system. This tug has independent paddle wheels with fixed blades. The wheels may be connected or disconnected under way. The main dimensions are:

Length between perpendiculars..... 118 ft. 1 in.
Breadth..... 23 " 7/4 "
Depth, moulded..... 13 " 1 1/2 "
Draught on trial..... 8 " 0 1/2 "
Power of the engines, about..... 700 h. p.
Weight on board { Coal in bunkers, 16 tons } 18 tons.
 { Crew, tow-rope, etc., 2 tons }

The conditions of trial were: Speed of 11 knots during six hours, the coal consumption not to exceed 2.1 lbs. per horse-power per hour; the getting up steam to be made within 30 minutes. Of course it is most important for a tug-boat to get steam up as quickly as possible, especially when employed on salvage service. This last condition has compelled us to put on board two different kinds of boilers—one of the Normand type, and one return-tube boiler of the ordinary type. We would rather have coupled two Normand boilers had not the owners asked that at least one of the two should be of the usual type, as they feared for the results of two-water tube boilers. The principal dimensions of the engines and boilers are:

	Pressure.....	114 lbs. per sq. in.
	Grate surface.....	34.70 sq. ft.
Normand	Heating surface.....	1560.20 "
Boiler.	Steam space.....	32.82 cu. ft.
	Water volume.....	82.58 "
	Grate surface.....	38.73 sq. ft.
Return-tube	Heating surface.....	1232.55 "
Boiler.	Steam space.....	176.45 cu. ft.
	Water volume.....	345.13 "
	Number of engines.....	2

Type of ditto—Compound two-cylinder inclined, the two engines being coupled together in the center of the shafting.

Diameter of high-pressure cylinders. 1 ft. 10 1/8 in.
Diameter of low-pressure cylinders. 3 " 3 3/8 "
Stroke..... 3 " 7 1/8 "

The wheels, with fixed blades, have an external diameter of 16 ft. 1 1/2 in. The general arrangement is a very disadvantageous one for the working together of two different boilers on the same set of engines. The whole is contained as usual in three different compartments, divided by two water-tight bulkheads.

The boiler of the Normand type is placed in the forward compartment, with its funnel forward and stokehold aft; the engines are in the center compartment; and the after compartment contains the return-tube boiler, with its stokehold placed forward. No special arrangement has been made for the steam and feed pipes, one single steam pipe making the communication between the two boilers through the engine-room, with a branch to each engine. In the same way, the feed pipe is common to both boilers, and communicates with two independent feed pumps placed on the side of the engine room, each one of which is sufficient to feed the two boilers. A single pump was working during the trials.

During the preliminary as well as the official trials, the working of the boilers gave no trouble, the pressure remaining steady. No difficulty was found with the feed whether the engines were worked connected or disconnected, the one ahead, the other astern, the one at rest, and the other running, just as the owners, who wanted to be quite sure about the general working conditions of a tug-boat, gave their orders. The time for getting up steam with the Normand boiler was, in two

trials, from 22 to 23 minutes. At the official trial for coal consumption, which lasted for six hours, the mean speed being 11 knots and the mean power 673 h. p. with 29.5 revolutions per minute, the consumption of coal was 1.81 lbs. per horse-power per hour, the fuel used having been briquettes d'Anzin. The engines running at full speed indicated 731 h. p. The quantity of coal burned in each boiler was pretty nearly the same on each trial. These results seemed to me worthy of notice, as they prove that it is easy to combine on board a ship water-tube boilers of the Normand system, or any other analogous type, with return-tube boilers, as it was carried out in the most difficult conditions—that is to say, coupled and in separate stokeholds. Therefore the dislike which certain owners profess towards them, on account of the fear they entertain of difficulties in working, is unjustified. I need not otherwise enumerate here all the advantages which those new boilers present as compared with the return-tube boilers.

NEW PATENTS.

Following is a list of the patents lately awarded upon inventions pertaining to navigation or water commerce: No. 542,876, Apparatus for Ejecting or Launching Torpedoes, to Stephanie Drzewiecki; No. 542,935, Apparatus for Closing Bulkhead Doors on Shipboard, to Alexander W. Montgomery-Moore, London; No. 542,503, Boom-Hitch and Loop Swing for rafting purposes, to John C. Sattes, St. Albans, W. Va.; No. 542,905, Bucket or Grip for Dredging or other purposes, to Colcord Upton, Salem, Mass.; No. 542,710, Towing Machine, Frederick Metcalf, Providence, R. I., assignor to the American Ship Windlass Co., same place. A full description of any of these can be obtained by applying to the Patent Office in Washington, mentioning the number of the patent, enclosing a small fee, and mentioning the MARINE RECORD.

FLOTSAM AND JETSAM.

Barney McGovern has been appointed harbor master at Kenosha.

Wing dams are being built in St. Joseph River to deepen the channel there.

Stage of water at the Sault at 8:30 a. m., Thursday morning, July 25, 14 feet 3 inches.

Saginaw and Bay City longshoremen have raised their rates from 35c. to 40c. per hour.

The cave-in at the Ironwood mine last week has exposed an extensive body of fine ore.

Mr. J. R. Oldham has extended the time for receiving bids on raising the Cayuga until next Saturday.

Ashland's ore shipments this season have reached 1,121,171 tons, of which 93,980 tons was shipped last week.

Oswego gentlemen think of buying the Bon Voyage and running her between that port and the Thousand Islands.

Capt. Bundy, of the gospel ship Glad Tidings, is out with a card denying that he has retired from the mission work.

Capt. G. H. Couvrette, who sailed the Egyptian last season, has invented a device for stopping holes in steel vessels below the water line.

Owners of lumber craft want the red second-class nun buoy at the entrance to the cut in Saginaw River replaced with a Pintsch gas buoy.

Capt. H. Buckley, formerly of the schooner Eagle Wing, has bought the schooner Arctic from Capt. John Sidney, of the steamer Dominion.

The Canadian steamer Petrel seized the nets of the fishing tugs Eschbacher and W. J. McCarter last Friday. Capt. Louch, of the former, has filed petition for redress, claiming that the Petrel is not using an up-to-date chart, and that they were really in American waters.

Capt. Hackett, who lost his life in the Torrent disaster, was one of the well known Amherstburg family, whose members have followed the water for generations. He was only thirty years old, and was married in 1892 to a Miss Burnett, of Cincinnati, whom he leaves in very comfortable circumstances.

The Colby mine, of which control has just been secured by Corrigan, McKinney & Co., produced its first ore in 1884, when its output was 1,022 tons. In 1885 it produced 84,302 tons; in 1887, 257,432; and in 1888, 258,880. It fell off in 1889 to 136,000 tons. Its total output is estimated at 1,385,574 tons. It classes with the Aurora, Ashland and other rich properties.

CASUALTIES OF THE WEEK.

With the exception of the accident to the tug Torrent, in the St. Clair Flats canal, which was as peculiar as it was lamentable, the mishaps of the past week have not been very frequent or very serious. The wreck of the Torrent has attracted a good deal of attention, as it is the first accident in that canal for a long time.

The schooner Yukon, in tow of the Sitka, bound down with ore, met a steamer, supposed to be the Parnell, at the upper entrance to the canal. It is stated that the Parnell, was increasing her speed as she left the canal, and was dragging considerable water after her, which caused the Yukon to sheer badly and graze the west bank, from which she rebounded and started toward the east bank, cutting off the passage of the tug Torrent, which happened along just then, bound up. From this point statements differ. The tug men say that Capt. Ralph H. Hackett, who was in command of the tug, reversed her but could not get out of the way of the tow line, which slipped up over the tug's stem and swept her decks of pilot house and a part of the engine and boiler room. The wheelsman on the tug states that Capt. Hackett shouted to the hands on the schooner to cut the tow line, but that this was not done.

The men on the Yukon corroborate most of these statements, but say the tug was backing at no time; that Capt. Hackett shouted to them to cut the tow line, and they replied that they had no ax; that he then shouted that he knew a way to cut it, and started the tug forward at full speed. The Yukon is so big that she was being towed with a ten-inch line, which successfully resisted the efforts of the tug; although according to the men on the Yukon, whose statement is corroborated by the amount of damage done, the tug made a considerable bight in the line, tightly stretched as it was between steamer and schooner. The schooner then began to come around, and the tug was borne towards the Yukon by the strain on the line. As she came nearer the higher vessel, the tow line slipped higher up on the tug's stem and the bluff of her port bow, until suddenly it slipped over the rail with force enough to instantly kill Capt. Hackett, and to tear off the house with such force as to fatally injure watchman David Kanary, of Port Huron, and to throw overboard wheelsman John Cattanch, of Marine City, whose body has not been found.

It thus seems that Capt. Hackett was using his best judgment as to the action necessary to get the tug out of a bad hole, and to avoid a collision which was certain to prove disastrous to the tug. The fact that below decks were eight men, besides his wife, whose lives were in his keeping, certainly would not tend to make him any cooler. It is, of course, a debatable question whether he could have avoided a collision by backing, but Capt. Hackett certainly did not think he could. It is an instance where it is very hard to attach blame anywhere, but it is certainly an argument for a wider cut at that point.

The whaleback steamer A. D. Thomson got ashore Saturday night on the head of Beaver Island, 14 miles west of the light. She had ore from Escanaba. She was released Monday by the favorite, after jettisoning 200 tons. She has a large hole in one of her forward compartments.

The other accidents of the week were mere grounding cases. The Wetmore fetched up on a sunken crib in Buffalo harbor. The Roanoke stranded while trying to enter Dunkirk, but was not injured. The Maryland, Maruba and Malta were blown ashore by a squall at St. Clair, but no damage is reported. The Mahoning got on at the Neebish, and had to lighter.

By her collision with the Northern King in the Sault, the Nyanza's damages consist of a hole in her starboard side 11 feet long and 3 feet wide, but no frames were broken. She patched up and continued her trip.

H. B. WEAVER, of Baltimore, an artist, owns what is probably the smallest practical steam launch in the world. It is 9 feet long by 32 inches beam, and will carry three persons. The propelling power is the smallest marine engine in the world. It is patterned after those used on large steamers, but weighs only 65 pounds. The hull of the launch is oak and cedar, and its complete weight, with all equipments, is 175 pounds. Mr. Weaver, who is 70 years old, is an expert mechanic as well as an artist, and has spent his spare time for 20 years, building the launch and her machinery. He has named her the Lizzie Weaver, in honor of his wife. He says he is not afraid to go to sea in her, and contemplates a coasting trip.

HARBOR IMPROVEMENT.

CONCRETE ON THE WELLAND CANAL.

Some interesting pioneer work in concrete pier building is now being carried out at Port Dalhousie, Ont. This work is being done by Battle & Newman, of St. Catharines and Thorold, and consists in the substitution of blocks of concrete for the present timber piers. An attempt was made to do the work by another contractor last year, but it was thrown up, and the present contractors have undertaken the continuance of it in a systematic way which augurs success. The work is being done on the east pier, on which the lighthouse is situated, for a distance of 700 feet shoreward from the end; the work for the balance is to be carried out in future seasons.

The narrow part of the pier is 20 feet, and the wide part 30 feet. The concrete is made in blocks 4 feet by 4 feet and 6 feet deep. These are prepared on the shore near the pier, and molded on a large circular table, so that 100 blocks can be made at once within the swing of a derrick-boom of 50 feet. The blocks, after being made, are swung on a tram car and carried thereon to the channel, where they are swung on to a scow by means of a stiff-legged derrick, and thence carried to their places in the pier.

A layer of these large blocks is made in white Portland cement on each side of the pier, and all the intervening space is filled up with a bed of solid concrete from hydraulic cement. In the present contract 1,500 barrels of Portland cement and 3,000 barrels of hydraulic cement will be used. The top of the pier is finished with a floor 1½ feet thick of concrete, nicely rounded at the edges of the pier, and having mooring rings cemented in at distances of 60 feet. The present season's contract applies to about 900 feet of the pier and has a fine appearance. The work is under the superintendence of James Battle, assisted by two able foremen, G. W. Read of Port Dalhousie and George Boyd, of St. Catharines. The government supervising engineer is W. G. Thompson.

MAJOR SEARS' REPORT.

Major C. B. Sears, in his annual report to the chief of engineers, recommends that the 200-foot channel at Rice's Point, at the head of Lake Superior, as embodied in the present project for improvement of Duluth and Superior harbors, should be widened to 400 feet. It is thought advisable to discontinue further repairs on the Superior entrance piers, and to widen all existing channels leaning to the old town harbor. About \$130,000 has been spent on the harbor work there during the year ended June 30.

The works at Two Harbors do not yet grant perfect security from southwest storms, but have proved so successful that the speedy completion of the projected piers is recommended. The belief of the existence of valuable mineral deposits back of Grand Marais, Minn., leads Major Sears to state that should these be opened and provided with railroad facilities the harbor may become important as an ore shipper. The present anchor acreage of 23.5 should be increased to the full harbor area of 61 acres, which would cost \$139,669.

At Ashland, Wis., satisfactory progress has been made on the breakwater protection of the harbor, and dredging work has been continued to secure a 17-foot channel. The Major says the survey for the Lake Superior-Mississippi Canal will be finished about Nov. 1.

Major Sears, in reporting on the state of Portage Lake Canal, says since the U. S. has taken charge the navigability off this waterway has been greatly bettered. During the past season the commerce through this canal amounted to 754,973 tons in weight and to \$28,099,583 in value, besides 37,636 passengers transported. This is an increase of 227,345, \$5,577,460 and 5,552 passengers respectively, over the year before. During the past year \$35,024 was expended on the waterway.

The reports on Marquette harbor and the harbor of refuge at Grand Marais, Mich., show progress in the establishment of the breakwater at the former and the improvement of the entrance of the latter, where a depth across the bar of 15½ feet has been obtained. The last river and harbor bill appropriated for a survey of the location of a canal to connect Lake Superior and the Mississippi River and designated three routes to be examined. The examinations have been made and the

results obtained will be submitted in time for the meeting of Congress, perhaps by November 1st.

COLONEL LYDECKER'S REPORT.

Lieut. Col. C. G. J. Lydecker has made his annual report. One of the most important works under his direction is the harbor at Michigan City, Ind., where the inner harbor is being improved for local commerce and the outer harbor for refuge of general lake traffic.

At St. Joseph harbor, Mich., work has been continued on the project to secure a channel 16 feet deep by building piers and revetments.

Wing dams are being built in the St. Joseph River for the purpose of deepening the channel to allow the river steamers to ply to several heavy shipping points that have been cut off by the long continued dry weather. Boats have been able to go only to Yellow Creek for ten days past.

At Grand Haven, Mich., a depth of 14 feet over the bar has been obtained, while great depths in the harbor show that the dredging and piers have proven successful by an increase of from one to two feet over last year.

Col. Lydecker in his report upon the harbor of refuge at Portage Lake, says that it is a much-needed improvement. The first proposition was to secure a channel 18 feet deep and 300 feet wide from Lake Michigan to Portage Lake. The estimate of the project was \$189,860 and the work was begun in 1879. He then points out how the small appropriation from year to year has caused the work to drag. There has been expended \$100,000 and at present a channel of only five to seven feet can be made. The pier and revetment work is in a condition of wreck and ruin. But the last river and harbor bill appropriated \$25,000 and it is expected the new policy will complete the work.

Good progress has been made on the Saginaw River, where \$658,523 has been expended securing a channel 14 feet deep and 200 feet wide from Saginaw Bay to South Bay City and 12 feet deep and 50 feet wide from there to the head of navigation.

Work on the harbor of refuge at Sand Beach, Mich., is nearing completion after an expenditure of \$1,184,374.

DRILLING THE DEFENDER'S CREW.

The English crews always lead us in the matter of taking in and setting canvas. An English crew will hoist a spinnaker loose and haul out the tack more quickly than an average American crew will get the same sail up in stops and break it out. If two boats are closely matched, then, indeed, the handling of sails may save the seconds necessary to a victory, though it must be admitted that this is less likely to be the case on our long open courses than in waters like those of the Clyde.

Mr. Iselin, however, decided early in the course of preparation for this year's races that the department of sail handling should be brought to the highest perfection. To that end his syndicate secured the 90-footer *Colonia*, one of the yachts built to compete for the honor of defending the cup in 1893, and fitted her out as a drill boat for Defender's crew. The crew itself consists wholly of American sailors, engaged at Deer Island, Me., where the smartest and hardiest of our fore-and-aft seamen are to be found.

The Defender's crew is as smart a body of seamen as ever hauled aft a main-sheet, and for weeks past they have been undergoing a thorough course of drilling in the art of handling the canvas of a 90-foot sloop. It is quite safe to say that the crew of *Valkyrie III* will not be able to show these lively sons of Maine any wrinkles in setting kites, and when the Defender has covered her first twenty miles to windward and rounds the outer mark—ahead, as all good Americans hope—it will not be seven minutes, as it was on a certain other yacht, before her spinnaker and balloon-jib topsail are driving her homeward to victory.—*Harper's Weekly*.

CHICAGO'S BIG DITCH.

Gordon H. Watt, C. E., of Chicago, continues his active opposition to the Chicago drainage canal. "In my opinion," Mr. Watt is quoted as saying in St. Louis last week, "the canal is a stupendous blunder—a fiasco, not only as a ship canal, but as a sewer, and Chicago will have spent millions, and in the end will not have gotten rid of one-fourth its sewage.

"The best lawyers in Chicago have agreed that the U. S. Government will not spend money on this work, as other cities would then be likely to demand federal aid with their sewage systems."

THE NEW GUNBOATS.

A comparison between the details of the two types of construction in the six gunboats for which proposals have now been invited, furnishes several points of much interest. They have in common a normal displacement of about 1,000 tons, and an indicated horsepower of about 800, giving to each the extremely moderate speed of twelve knots. The normal draught of each to the bottom of the keel is twelve feet. This will allow them to be used in river service on foreign stations.

While the four vessels of the single screw type have a length of 168 feet on load water line, and an extreme beam of 36, the twin screw vessels have a length of 174 and a beam of 34. Again, the former carry full sail power, while the twin screw vessels have steadying sails only, and depend on engine power. The boilers in the two types of vessels are of the same character, each boat having two single-ended Scotch boilers; but, of course, there is a difference in the engines, that of the single screw boats running at 150 revolutions to develop the required 800 horse-power, and the two engines of the twin screw boats running at 200 revolutions in developing the same power. An uncoupling arrangement used when the single screw boats are going under sail alone allows the screw to revolve by the action of the water, and it is believed that little retardation will result.

Still another difference in the two types is that the normal coal supply of the single screw boats will be 100 tons, with a total bunker capacity of 238, while that of the other type will be 120 tons, with a total capacity of 250. This difference is due to the fact that the auxiliary sail power will allow a reduction of coal in the single screw type.

If we compare the new composite vessels with existing steel gunboats, the *Castine* and *Machias* come nearest to them in displacement, being 1,177 tons, and they have a mean draught of 12 feet. The Bath-built boats, however, are 30 feet longer with nearly two feet less beam. In addition, they have 1,873 and 2,199 horse-power respectively, or between two and three times what is to be supplied to the new vessels. It is therefore not surprising to find that their speeds are in the one case 3½ and in the other 4 knots above what is expected of the six new vessels. The normal coal supply of the *Machias* and *Castine* is a little greater, but the total bunker capacity is less.

The three gunboats building at Newport News are more distinctively light draught than the six now to be built, since one of them has but 11 feet and the other two 9 feet of mean draught. They differ considerably from the new vessels in all respects. One vessel is 46 feet longer and two feet broader, with 371 tons more displacement, while the two others are over 76 feet longer, 4 feet broader and of 392 tons more displacement. They also have a larger bunker capacity, and about double the indicated horse-power, and two of them have 1 knot and the third 2 knots more speed than the newest gunboats.

The advantages of composite gunboats in requiring less docking, and hence in being able to keep the seas longer, were fully set forth when these vessels were planned. It may, however, be pointed out that chief constructor Hichborn has for years been a strong advocate of sheathed and composite vessels. When the Newport News gunboats were planned it was hoped to make one or more of them composite, but it was found that the language of the law would not allow this to be done. However, precautions were taken in the last naval act to alter the customary wording so as to allow these new vessels to be composite. It may be observed that in the nine latest gunboats the great aim has been that of special adaptability to river and other service in foreign waters, such as those of the Asiatic and South American stations, combined with economy of cruising, and to this result high speed has been sacrificed.

The three books of "Sailing Directions," published by the Hydrographic Office, covering Lake Superior and St. Mary's River, Lake Michigan and the Straits of Mackinac and Lake Huron and Lake St. Clair with Detroit and St. Clair Rivers, can be had at the office of THE MARINE RECORD, 144 Superior street, Cleveland, O. Price, \$1.00 each.

A STEEL ship has been constructed in Cardiff with the standing rigging as well as hull all of steel.

IN THE ENGINE ROOM.

NEW QUADRUPLE EXPANSION ENGINE.

(ILLUSTRATED.)

Mr. David Lumgair, of West Bay City, Mich., has applied for and will receive, in a week or two, patents on a quadruple expansion condensing engine, which, it is claimed, is suitable for the heaviest marine work, and for stationary purposes as well. The principles can also be applied to the triple expansion engine for those who prefer lower steam.

The working of this engine will readily be understood by examination of the accompanying illustration. Steam from the boiler enters the high pressure valve chest through opening *a*, and enters the lower end of the cylinder on the top side of the valve, leaving the cylinder through the bottom side of the valve. It then enters opening *b*, and passes through pipe *b* to the upper end of the valve chest, and enters the top end of the cylinder

tion with the upper valve on the high pressure end, the engine could be forced in case of emergency. In trying it on a 12, 17 and 24-inch triple expansion engine, 25 more turns per minute were made.

The inventor, Mr. Lumgair, claims for these engines that they are easily handled and reverse well. They take up little room in the boat, there are only two sets of engines to look after and the pistons are easy to get at. The first cost is low, and the fuel consumption is small.

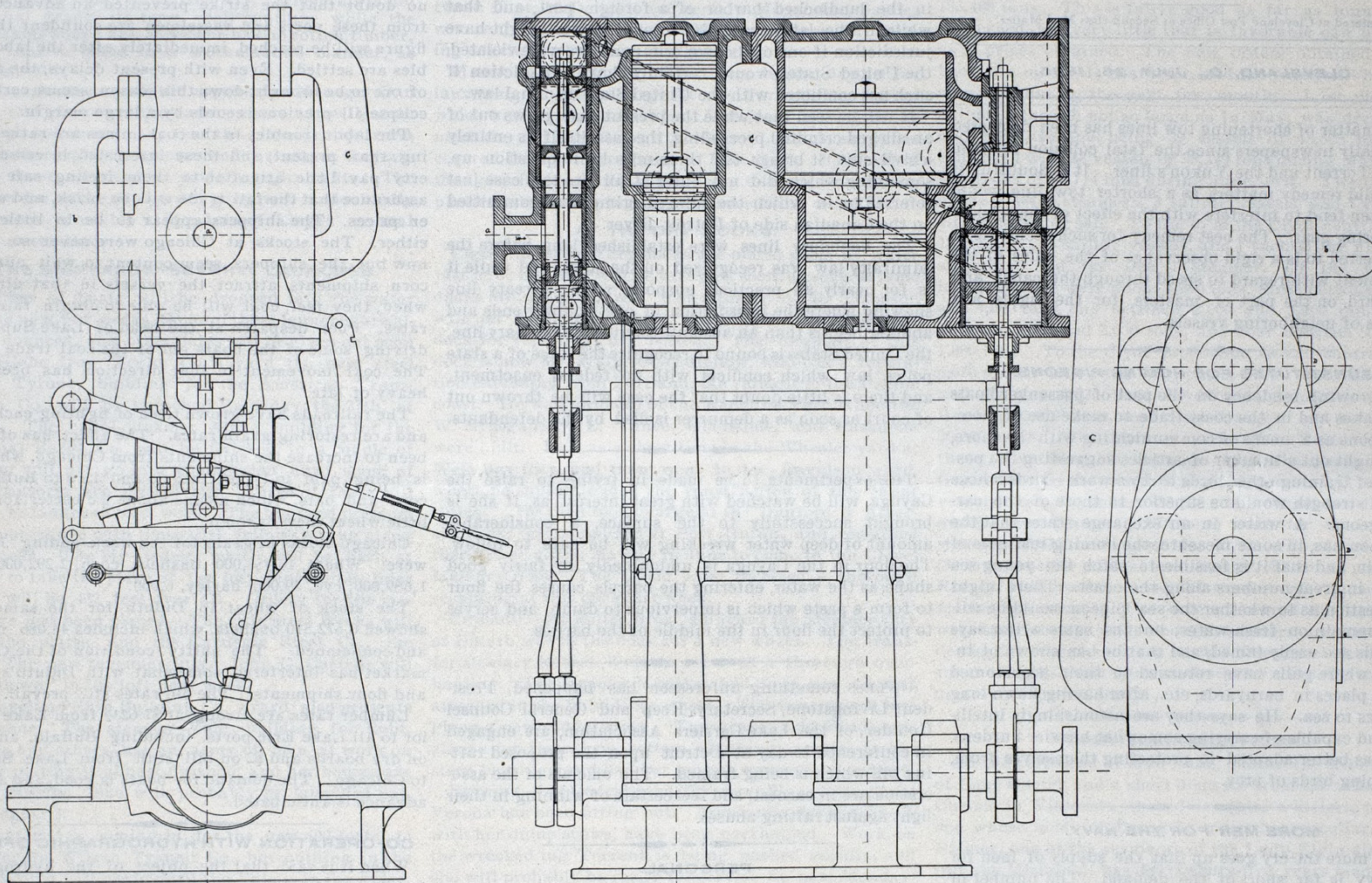
LIFE OF MARINE ENGINES.

An interesting instance, showing the duration of the working life of a set of first-class marine engines and boilers, is to be noticed in the case of the White Star Liner Germanic. This steamer left Belfast in the year 1875 to take her station on the White Star Line between Liverpool and New York, and from that time until she was returned to her builders at the end of last year to receive new boilers, etc., she was regularly at work on the Atlantic, and made no less than 211 round voyages.

timate contact with the shell. The fiber of the coil is at right angles to the circumferential stresses, avoiding the risks common to pipes with brazed or welded joints and to drawn pipes where the fiber of the metal, being parallel to the circumferential stresses, is in the least effective position for resistance. The steam coil is wound on the shell while it is rotating in a bath of molten alloy, the melting point of the alloy being sufficiently high to be unaffected by the temperature of steam of high pressure, and by this process shell and coil are fused into a solid mass.

TO DETERMINE FURNACE TEMPERATURE.

In a recent communication to the Academie des Sciences, M. Berthelot suggests a method of determining the temperature of a furnace which is based on the fact that the refractive index of a gas varies with its density. Two tubes filled with the same gas are taken and a spectrum refracted through each, the two spectra being observed together. If then one is raised to a high



QUADRUPLE EXPANSION ENGINES—A BAY CITY INVENTOR.

Cylinders 6, 8 $\frac{1}{4}$, 11 $\frac{3}{4}$, and 15 $\frac{3}{4}$ inch by 10 inch stroke.
a, Steam from boiler.
b, High pressure to first intermediate.
c, First mean to second mean pressure.

d, Between pistons to condenser.
e, Exhaust to condenser.
 $\frac{1}{8}$ -inch valve and connections live steam to first mean pressure.
 Valve for reversing not shown in plan.

on the bottom side of the upper valve, leaving the cylinder through the top side of this valve, where it enters pipe *c*, leading to the second intermediate pressure valve chest. The steam enters this cylinder through the bottom side of this valve, and leaves on the top side of the valve; it then passes into the low pressure valve chest, enters the valve on the top side, and exhausts through this valve into the condenser through opening *e*.

The high pressure, first mean pressure, and second mean pressure are piston valves; the low pressure valve is a slide valve. The spaces between the two pistons on each engine are connected to the condenser. A live steam pipe, with valve connection, is placed under the valve on the first intermediate pressure.

There being always a vacuum between the two pistons the difference in area of the two cylinders, multiplied by the vacuum, will give, in the small engines shown, 4 h. p. to the first two cylinders, and 16 h. p. for the other two cylinders, and equals the power gained by the vacuum.

It was found that by opening the live steam connec-

422 passages across the Atlantic, or more than one and one-half million statute miles. The original engines, after nearly 20 years' work, have been taken out, as well as the boilers, and are now replaced by the latest type of triple-expansion engines. The machinery, it may be taken for granted, is still fit for service in a meaner capacity; but judging from the foregoing it may be concluded that 20 years hence the best machinery of the present day will be found old-fashioned and unfit to compete with the machinery of the future.

A COMPOSITE STEAM PIPE.

A composite steam pipe which, its designer claims, meets the requirements of increasing pressures, and at the same time possesses the advantages of a copper pipe, has been patented by Mr. R. D. Smillie, electrical engineer, Glasgow. It consists of a shell of copper of sufficient strength to withstand the longitudinal stresses produced by any given pressure of steam acting on the sectional area of the pipe. The circumferential stresses are provided for by a coil of steel wire, having a high tensile strength, being wound closely round and in in-

temperature, and its contents allowed to expand, so as to maintain the pressure inside constant, it will be necessary to reduce the pressure in the second tube in order to re-establish coincidence between the two spectra. Preliminary experiments in the laboratory have shown the method to be capable of giving very accurate results.

NEWLY ENROLLED TONNAGE.

Official numbers have been given to the following lake-built craft, which are now enrolled in the government "blue-book": No. 3,655, steamer Buckeye Belle, built and owned at Toledo, measuring 10.34 tons gross and 7.04 tons net; No. 136,515, steamer Elsa, built and owned at Sandusky, 33.73 tons gross and 27.92 tons net; No. 116,682, steamer Sacramento, built at West Bay City, and hailing from Port Huron, 2380.88 tons gross and 1903.33 tons net; No. 145,696, sloop Trix, built and hailing from Chicago, with a gross and net tonnage 9676.

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THE matter of shortening tow lines has been discussed in the daily newspapers since the fatal collision between the tug *Torrent* and the *Yukon's* liner. It is doubtful if this would remedy matters, as a shorter tow line would very often tend to interfere with the effect of the schooner's steering gear. The best remedy for such accidents as that referred to is a rigid observance of the rules of the government with regard to speed through the canal, and due regard, on the part of masters, for the rights and interests of neighboring vessels.

SUBSTITUTES FOR HOMING PIGEONS.

The growing tendency on the part of passenger boats on the lakes and in the coast trade to make use of homing pigeons as a means of communicating with the shore, has brought out a number of articles suggesting the possibility of training other birds to this work—birds whose size and strength would be superior to those of the carrier pigeons. A writer in an exchange states that the sea pigeon has, in some measure, the homing instincts of its cousin, and that it is feasible to catch the young sea pigeons in great numbers along the coast. There might be a question as to whether the sea pigeon would be willing to remain on fresh water; but the same writer says that gulls are easily tamed, and that he has known of instances where gulls have returned to their accustomed feeding places in barnyards, etc., after having flown long distances to sea. He says they are astonishingly intelligent, and capable of carrying somewhat heavier burdens, as well as better adapted to protecting themselves from, or escaping birds of prey.

MORE MEN FOR THE NAVY.

Once more the cry goes up that the supply of men for the navy is far short of the demand. The number of officers in the navy as shown by the roster just published, is about 2,000, perhaps enough to take proper charge of the various lines of duty on board the hundred and more vessels of which the navy will consist when the ships now building shall have been completed. There are about 10,000 marines and seamen in the service, or about two-thirds the proper number. A large percentage of these are foreigners by birth, and many of them, it has been charged, are foreigners by allegiance. There is a lamentable scarcity of good stout Yankee blood, and bone and sinew in the American navy, and Congress has only partially met the movement of Young America towards the water service in its encouragement of the naval reserve movement. It is to be earnestly hoped that the good results shown in the training of the naval reserve companies at Chicago, Detroit and elsewhere may give a new impetus to the movement. The coming fall and winter will be good seasons in which to agitate and arouse an interest in the apathetic youth at some of the ports, and it seems that any body of men thoroughly organized, and ready and anxious for opportunities to enlist in this service, can hardly fail to obtain substantial support and encouragement from Congress at its coming session, when so many points of issue with foreign powers will be brought to their attention in the usual communication of the President.

WHEN THE LAKES ARE HIGH SEAS.

The tug *W. G. Harrow*, which was chartered to State Game Warden Buntain last Sunday when more than a hundred gill nets were seized, because their owners were caught, it is alleged, fishing in state water during the closed season, was seized under a libel demanding \$1,000 damages, the libel being brought by Crangle & Co., one of the dealers whose nets were seized.

The libel appears to be based upon a decision handed down by the Supreme Court of the United States some eighteen months ago, in reference to a crime committed on board an American vessel which was at that time in Canadian waters on Detroit River. The question was one of jurisdiction, the defendant claiming that the case could be tried only by the courts of Canada, as the crime, if committed at all, was committed in Canadian territory. The decision of the Supreme Court was adverse, the court holding, as had been held before, that an American bottom, so far as criminal jurisdiction was concerned, was a part of American territory anywhere in the world, even in the landlocked harbor of a foreign port; and that while in the latter case, the foreign power might have jurisdiction if one of its own criminal laws were violated, the United States would certainly have jurisdiction if such act conflicted with the United States criminal law.

It will be seen that while the present case grows out of an alleged criminal proceeding, the case itself is entirely a civil suit; it brings the three-mile limit question up, something which did not enter at all into the case just referred to, in which the alleged crime was committed on the Canadian side of Detroit River.

The boundary lines were established long before the admiralty law was recognized on the lakes, and while it is for nearly all practical purposes, rather a treaty line showing where the jurisdiction of one country ends and another begins than an absolute territorial boundary line, the United States is bound to recognize the force of a state police law which conflicts with no federal enactment, and there is little doubt that the case will be thrown out of court as soon as a demurrer is filed by the defendants.

THE experiments to be made in trying to raise the Cayuga, will be watched with great interest, as, if she is brought successfully to the surface, a considerable amount of deep water wrecking will be sure to follow. The flour in the Cayuga is undoubtedly in fairly good shape, as the water, entering the barrels, causes the flour to form a paste which is impervious to damp, and serves to protect the flour in the middle of the barrels.

UNLESS something unforeseen has happened, President Livingstone, Secretary Keep and General Counsel Goulder, of the Lake Carriers' Association, are engaged in conference to-day at Detroit upon the proposed rafting bill which is being framed. The officials of the association are in earnest, and feel certain of winning in their fight against rafting abuses.

PERSONAL.

President Livingstone, of the Lake Carriers' Association, visited Cleveland Tuesday.

Mr. James Graham, of Detroit, was in Cleveland Tuesday, working up his river coal trade.

Mr. Ashton Oldham has been taking an outing trip to Two Harbors on one of the Minnesota liners.

Capt. and Mrs. John Swainson and Miss Swainson have left for a two months' visit in England.

It is said that Capt. J. M. Clossey, of the Rochester, will be made master of the Owego when she comes out of dry-dock.

Capt. F. D. Herriman, agent of the Bureau Veritas for the lakes, looked over the Yale at the Cleveland shipyard Wednesday.

Major W. B. Stockman, local forecast official at Cleveland of the Weather Bureau, is taking a trip up the lakes on the steamer *William F. Sauber*.

On Wednesday evening of last week Miss Mary Sauber, daughter of Wm. F. Sauber, of Marine City, the well-known lake engineer and vessel owner, was united in marriage to Mr. John Weng, also of Marine City.

Capt. C. S. Furey, who is at present on the steamer *Shenandoah*, will bring out the new steamer *Sacramento*, now nearing completion at Davidson's shipyard in West Bay City. Capt. Frank Welcome, late of the *Northern King*, will go on the steamer *Shenandoah*.

THE FREIGHT SITUATION.

Thursday morning finds the exact situation in both coal and ore a little uncertain by reason of labor troubles at the mines of both. The strike in Michigan is extensive, but the mine owners have made a proposition to the miners, which, while not granting all their present demands, increases their wages somewhat, and promises them a considerable advance next year. Together with the proposition has been submitted a statement showing that most of the mines lost money in 1894, and that the advance in prices obtained this year have been somewhat offset by advances in freights. It is thought that work will be resumed soon in all the Michigan mines. The effect of the strike has been to stop shipments from Marquette almost entirely, and to reduce Escanaba shipments to a few stray cargoes. This has driven a large number of boats into the Lake Superior trade, but this increase in supply has not affected the 85c rate, and chartering at that figure from the head of Lake Superior continues brisk. There is no doubt that the strike prevented an advance to 90c from these ports and vesselmen are confident that this figure will be reached immediately after the labor troubles are settled. Even with present delays, the amount of ore to be brought down this season seems certain to eclipse all previous records by a large margin.

The labor troubles in the coal mines are rather pending than present, and those interested in vessel property pay little attention to them, feeling safe in the assurance that the fall trade will be brisk, and at higher prices. The shippers appear to be in little hurry either. The stocks at Chicago were never so low as now but the shippers seem content to wait until 1895 corn shipments attract the vessels in that direction, when, they feel, coal will be able to obtain fairly low rates. Poor despatch at the head of Lake Superior is driving some of the boats out of the coal trade at 30c. The coal movement in that direction has been very heavy of late.

The railroads have grown tired of fighting each other, and are restoring grain rates. The effect has of course been to increase the shipments from Chicago, when 2½c is being paid to Lake Ontario and 1¼c to Buffalo, on corn and oats, which means about ¼c better for what little wheat there is to go.

Chicago stocks of grain for the week ending July 20, were: Wheat, 16,455,000 bushels; corn, 2,292,000; oats, 1,689,000; rye, 39,000; barley, 6,000.

The stock of wheat in Duluth for the same week showed 6,572,510 bushels, which includes 48,086 rejected and condemned. The shifty condition of the Chicago market has interfered somewhat with Duluth's wheat and flour shipments. The old rates still prevail.

Lumber rates are strong at \$1 62½ from Lake Superior to all Lake Erie ports, including Buffalo, and \$1 75 on dry boards and \$2 on bill stuff from Lake Superior to Chicago. The demand for boats is good, and an early advance is anticipated.

CO-OPERATION WITH HYDROGRAPHIC OFFICE.

When it is said that the object of the hydrographic service on the Great Lakes is the collection and dissemination of marine news, very few people understand what it really embraces. Visitors to the office see a large portion of the space in the office taken up by the apparatus for the reception of time, and the dropping of the time ball. Another large portion is occupied by the chart and publication cases. To the casual observer, then, it would seem that the office was for the dissemination of time, and the publication of charts.

But before marine news can be distributed it must be collected, and the more facts of value to the marine world collected, the more valuable the office becomes. The hydrographic office, then, is a co-operative service; and in order that it may be of benefit to the mariners on the Great Lakes, it is necessary that the mariners co-operate with it, by each one giving it any information which would be of interest to people in the same portion of the lakes as themselves.

The observation forms which have been sent out to a number of the masters on the lakes, are valuable when filled out; and the deductions from the data thus assembled becomes more valuable as the number of the observers increases.

All communications addressed to either of the branch offices in Chicago or Cleveland, or to the main office in Washington, are assured prompt attention; but it must be remembered that a personal visit is much preferable to a letter.

SHIP BUILDING AND REPAIRS.

NEW CLASSIFICATION RULE PROPOSED.

It has been proposed that a change be made in Sec. 6 of the classification rules of Inland Lloyd's Vessel Register, relating to A1½ boats. The rule at present provides that "new vessels not equal to the requirements of A1, but coming within 5 per cent., and all vessels regularly lapsing from that grade (after ten years of service) shall be classed A1½. When this is not the original grade, its term shall be three years, providing there is no rot nor decay in frame, ceiling, or any other part."

There were a goodly number of wooden boats built in 1881, which would, under this rule, lapse into the A2 class next year. In order not to bear too heavily upon these vessels, it has been proposed to amend the rule during the coming winter to read as follows:

"New vessels not equal to the requirements of A1, but coming within 5 per cent., and all vessels lapsing from that grade, shall be classed A1½; when this is not the original grade, its term shall continue while the vessel retains shape and sheer and has no rotten timber, and has repairs made in a workmanlike manner, as originally built."

This change meets with the approval of Manager Dan McLeod, and of most of the underwriters as well, some of whom go so far as to say that the classification rules should be thoroughly gone over and revised, as they are in many cases unsuited to modern requirements. The matter, so far as the above rule goes, will undoubtedly be acted upon favorably at the Inland Lloyds' annual meeting next winter.

AT THE SHIPYARDS—SEVERAL LAUNCHES.

A number of boats will be dropped into the water within the next few weeks. Some of these launches are already announced, and other dates will be given out soon. At the Globe Iron Works Co.'s yard the new steel schooner Tyrone, building for the American Transportation Co., will be launched Saturday, the 27th, at 2:30 p. m. The canal steamer Alpha, building for the Steel Canal Barge Co., will be finished in a couple of weeks, but will not go into commission until some of its fire consorts are turned out. Three of these will probably be launched next week. The big yard presents an odd appearance with these little fellows strung along on the stocks. The big steamer which will be built at this yard to take the place of the lost Menominee liner Norman, will be 432 feet over all. Orders for the material have just been placed. The Otis Steel Works will furnish the plates, and the Carnegie Steel Co., the angles. The new revenue cutter John G. Carlisle will be "laid down" in the loft next week.

The Cleveland Ship Building Co.'s yard also presents a busy scene. The steamer Yale, building for Robt. R. Rhodes and others, has an army of men at work on her. Her plating is almost finished, and her houses are going up rapidly. She will probably be launched Saturday, August 3.

More material is coming in for the new 400-footer to be built for the Wilson Transit Co., but nothing in the way of erection will begin until the Yale is in the water. The scaffolding around the new boat's berth is already up, however.

BAY CITY.—The Penobscot, building for the Eddy-Shaw syndicate, of Detroit, at Wheeler & Co.'s yard, will be launched next Saturday. Her boilers, weighing 63 tons each, and said to be the largest on the lakes, have just been hoisted into position. A start is being made on the new boat ordered by Whitney, of Detroit. The reports circulated last week that the lines of this boat would be drawn for speed, regardless of carrying capacity, have been officially denied by Mr. Wheeler, who says her lines will be similar to those of the Curry and Merida. At Davidson's yards the Sacramento, sister ship to the big Rappahannock, was to be launched Wednesday, and will be in commission shortly. The two car ferry barges for the Wisconsin-Michigan Co., really the "Soo" line, are well along toward completion. Mr. Davidson has abandoned the idea of establishing a steel shipyard this year.

DETROIT.—The principal work of the Detroit Dry Dock Co., is at Wyandotte, where slow progress is being made in the hull of the new Cleveland & Buffalo Line steamer. The engine, which is building by Fletcher & Co., of New York, is nearly finished, as are the boat's big boilers. Vexatious delays in receiving material have prevented a start at erecting the boat, but her

builders expect to have no trouble in turning her out on time. Designer Frank E. Kirby says he can increase the speed of the State of Ohio two miles per hour.

TOLEDO.—The first of the Conneaut-Port Dover ferry boats, which was to have been launched last Saturday at Craig's shipyard, is still on the stocks. Work is progressing steadily, however, and the boat will be ready for service before many weeks.

CHICAGO.—At the Chicago Ship Building Co.'s yard on the Calumet, the steamship Victory, the first of the 400-footers, will be ready for delivery to her owners within a few days. The Zenith City is well along towards the launching stage and will be placed in the water very soon. The schooner building for Mr. John Corrigan is also well advanced.

WEST SUPERIOR.—At the American Steel Barge Co.'s yard work is rather quiet. The second of the Standard Oil Co.'s tank barges has just left the yard, and some little repair work is about the only thing on hand. There has been, it is stated, considerable figuring between Capt. McDougall and certain Milwaukee parties who contemplate building a 400-foot steamer, but nothing conclusive has been reached.

MARINE CITY.—To-day, Thursday, is the day set for launching the steam barge George Farwell, the hull of which has been built by Alex. Anderson, to receive the machinery of the George L. Colwell, which never recovered from her experience at Deer Park. The hull of the Colwell was almost given away to some Port Huron parties, who are trying to make something out of it.

AT THE DRY DOCKS.

Cleveland's three dry docks are placid pools of water just now, but they will be occupied soon, as several lame ducks are bound down. The steamer A. D. Thomson will on Thursday night enter the Cleveland dry dock for repairs to her bottom. The foreman of this dock is now Mr. Wallace Goodfellow, who has a reputation extending from Portland, Me., almost to the Pacific coast. He was foreman of the Radcliffe yard when the W. M. Egan, F. L. Vance, Gladstone, and Pasadena were built. He was a short time in the Wheeler yard at West Bay City, and then went to the Davidson yard, where he superintended the construction of the "Four Cities." He then took charge of the Dunford & Alverson dock, just completed at Port Huron, and remained there three years, leaving in June to come to the Cleveland dry dock. The Little Jake received a thorough recalking at this dock last week.

CHICAGO.—At Miller Bros.' shipyard the steamer City of Duluth was in the dock for a new wheel. The transfer steamer Robert Wallace received a thorough overhauling. The steamer Manitou had four new buckets attached to the hub of her wheel. The Conemaugh was given a new rudder stock. The steam yacht Hinda was also in for some new bottom planking, repairs to her stern bearings, and had her bottom scraped and painted.

DETROIT.—At Oades' yard the new Wyandotte yacht Verona has been fitting out. Breyman's dredge No. 2, with her dump scows, have been overhauled. Work on the wrecked tug Torrent is being pushed rapidly, and she will probably be ready for service by next Monday. The tug Magnet was hauled out in the ways last week for repairs. The steamer Gould got a new wheel at the Detroit dry dock. The steamer Mary H. Boyce left the upper dry dock last week, after getting full repairs. The tug C. A. Lorman has been having her boilers overhauled.

PORT HURON.—The rebuilding of the steamer H. E. Runnells will consume about one month. The schooner Lyman Carey arrived Tuesday with a leak, which will be stopped. The schooner Pandora (Br.) has been getting a new foremast head at Dunford & Alverson's dry dock.

WEST SUPERIOR.—The steamer P. P. Pratt, which went aground near False Detour several days ago, and lighted off, is in dry dock for a new fore foot and considerable new planking. She will probably be in dock all week. The barge 130, recently ashore at Hammond's bay, has been receiving repairs.

MILWAUKEE.—The Westover is getting a new boiler and deck house.

STURGEON BAY.—The tug George Nelson had some needed calking done last week and had new wale strips put on both bows.

BUFFALO.—It is estimated that repairs to the Owego, in the Union dry dock, will require fully five weeks. The loss is estimated at \$20,000. Her starboard side is

badly crushed in, while the port side seems uninjured. The City of Rome has been getting new blades on her wheel. The Thomas Maytham, which punched a hole in her bottom on leaving Sandusky on her last trip, by striking a rock, had a temporary patch put on her bottom in the Union dry dock early this week.

GRAND HAVEN.—Six Grand Haven ship carpenters have organized the Grand Haven Co-operative Shipyard Company, and, having leased the plant of the Grand Haven Shipbuilding Company, will build and repair boats.

The dismantled schooner Naiad has been receiving receiving repairs at Manitowoc.

The schooner Mary L. Breck is receiving general repairs at Sarnia.

SCOTTISH SHIPBUILDING.

With the figures of June available, the output of Scottish shipbuilders for the half-year is known. The result is better than in 1894, being 191,880 tons against 183,488 tons. This is fairly good as far as tonnage is concerned, but very little that is favorable can be said as to prices obtained. The new orders obtained have been of a moderate character, and the yards will be well employed during the next few months. Last month's output, although not so large as in May, was decidedly above the average, being 29 vessels of 45,525 tons, as compared with 38 vessels of 55,249 tons during May, and 45 vessels of 40,714 tons during June, 1894. Twenty-one of these were steamers, 3 sailing vessels and 5 yachts, either steam or sail. To the Clyde contributed 18 steamers, 3 sailing vessels, and 4 yachts; the Forth, 3 steamers, and the Dee 1 steamer. Of the vessels launched, five were about 4,000 tons, three between 3,000 and 4,000 tons, one between 2,000 and 3,000 tons, five between 1,000 and 2,000 tons, and four between 500 and 1,000 tons. To the Clyde proportion Govan contributed 4,650 tons, Partick and Whiteinch 9,740 tons, Renfrew and Paisley 4,735 tons, Clydebank, Dumbarton, and Bowling, 2,670 tons, and Port-Glasgow and Greenock 20,260 tons. With the exception of a Fairlie yacht, there have been no launches from the yards below Greenock. Of the month's total, 15 steamers, 2 sailing vessels, and 3 yachts (33,325 tons) were for British owners, two steamers (4,879 tons) were for Spain, two steamers (7,030 tons) were for Denmark, one steamer (30 tons) was for Africa, one steamer (70 tons) was for Russia, while two steamers (200 tons) were returned as for foreign owners. The orders secured during June were satisfactory, while Scottish builders are also tendering for other important work. These include vessels for the English and Irish mail service, and 20 torpedo destroyers for the navy.

A LADY ELGIN SURVIVOR.

On the north end of Mud Lake, one of the tributaries of Lake Chetek and a short distance from the village of Chetek, in Wisconsin, there lives quite a historic being, one whose mode of living is somewhat peculiar. Hi. Palmer, one of the survivors of the Lady Elgin disaster in Lake Michigan, has for twenty-five years made this lonely place his home. Living in a one-story log hut built by himself twenty-five years ago, he lives the life of a hermit, fishing in the summer and hunting in the winter. When he visits Chetek he is dressed in blue drilling overalls reaching only to his knees; his vest is one of his own make, as well as the moccasins which he wears. He has the face and figure of "Uncle Sam." His neck is covered with a bushy growth of whiskers, and a goatee, silvery white, grows straight out from a well rounded and characteristic chin. Whenever he pays Chetek a visit the children all treat him with much respect. The younger generation all look upon him as a supernatural being.

When speaking of the loss of the Lady Elgin, his eyes fill with tears and his voice falls to a low monotone. His description of the shrieks of the drowning people, and frenzied seamen and helpless officers bring tears to the eyes of the listener. He was saved by the aid of a life preserver, and after floating for hours he was picked up by a searching party, void of all clothing and about dead. He remembered nothing after until he awoke in a Milwaukee hospital. Palmer cares very little for his fellow beings, and it is said that poverty is not the cause for his mode of living, but that in his younger days the girl he loved jilted him, and since he has had an intense hatred for females. Since living in this lonely place he has never visited any other place except Chetek, and never in his life did he ride on a railroad train.

MARINE LEGISLATION.

THE LAKES AS HIGH SEAS.

A libel has just been brought in the United States District Court, in Cleveland, which is obviously based upon a decision of the U. S. Supreme Court, handed down a year and a half ago, that the lakes were to go considered high seas.

The libel was brought Monday by James H. Norman, W. H. Crangle, Joseph Builder and Louis Rief, members of the firm of Crangle & Co., fish dealers, against the tug W. C. Harrow and her equipment, and "against all persons lawfully intervening for their interest therein, in a cause of marine tort, civil and maritime."

The libel sets forth that the tug was used on July 21, 1895, for the purpose of unlawfully seizing 54 gill nets which had been set by the plaintiffs in the high seas on Lake Erie, or more than a marine league from shore, as well as two tons of lake herring which were in the nets, the whole being valued at \$222. These persons, the libel sets forth, have threatened to confiscate the same, and to sell them and convert the proceeds to their own use, and now have the same in their possession. The libelants allege further damage in the way of inconvenience, etc., the whole amounting to \$1,000.

Mr. E. R. Edson, owner of the Harrow, bonded the boat Tuesday, and she was released. The tug was used by State Game Warden Buntain on the date mentioned, under a regular charter, for the purpose of seizing the nets under the law of the state of Ohio, which prohibits fishing in the waters of the state during a closed season which continues during most of the summer. (See Ed.)

THE ORR-SMITH COLLISION CASE.

Judge Seaman has rendered an important decision at Milwaukee in the suit of the Leatham & Smith Wrecking & Towing Co., of Sturgeon Bay, against C. W. Elphicke and others, of Chicago, which grew out of the collision of the steamers Thomas H. Smith and Arthur Orr. The Smith was sunk by the Orr three miles off Wind Point, north of Racine, on the foggy night of November 11, 1893. There was a misunderstanding of signals, and the Orr plowed four feet into the bows of the Smith, sinking her almost instantly. Her owners fixed her value at \$25,000 and sued to recover that amount.

Judge Seaman decided that both boats were at fault and ordered an equal division of the damages. The evidence had shown, he said, that the Orr had been traveling too fast and was at fault in that she did not stop when she failed to clearly understand the Smith's signals. On the other hand, the Smith had failed to stop when she heard the Orr's signals, and, instead, had ported and swung across the Orr's bows. She should have waited until she fully understood the Orr's signals before changing her course. Under the circumstances he could not hold that it was a maneuver in extremis which could be excused. If the owners fail to agree as to the amount of damages there will be a reference to a master to determine the amount.

An interesting point was raised by the attorney for the Smith to prove negligence and responsibility on the part of the Orr. The Smith left Chicago before the fog settled down, but the Orr left Milwaukee in the thick of it. The attorney for the Smith raised the point that the master of the Orr had been guilty of negligence in leaving port in a fog. Judge Seaman decided that it was not negligence. He said that he was satisfied that leaving port in a fog could not be held to be per se negligence. The law as he understood it allowed a vessel to leave in a fog, but constrained her to the utmost care to avoid collisions.

BUILDING AND SALE OF VESSELS.

Where a vessel was to be built under a contract providing for payment by installments as the work progressed, it was decided that the question whether the title passed immediately to the purchaser was not determined in the negative by the fact that the contract gave them a right, in certain contingencies, to reject the vessel after completion and recover the money paid; nor in the affirmative by the fact that part of the earlier installments was to be paid in bonds of the purchasing company, secured by mortgage, which was to include the vessel herself, together with other specified property. The rule in this country—contrary to that in England—is

is that under a contract for the sale of a vessel, to be paid for as the vessel progresses, the title remains in the seller until delivery, in the absence of any provision indicating apposite intent, but the question is one of intent purely. And where there are no express provisions in the contract indicating the intent of the parties as to whether title in the vessel shall pass before delivery or not, it is competent to prove an oral agreement, made before execution of the contract, that the title should pass when work was commenced, as there is nothing in such an agreement which tends to contradict or vary the written contract.—Bacon vs. The Poconoket, U. S. District Court, E. D., Pennsylvania.

A QUESTION OF JURISDICTION.

Marine Lawyer Josiah H. Cook is contesting the libel on two canal boats on the ground that the United States courts have no jurisdiction, as canal boats, other than steam boats, are not enrolled and licensed vessels. Mr. Cook will make this a test case, as it is the first action of the kind ever brought. His client is the Third National Bank, of Buffalo.

THE ST. CLAIR FLATS CANAL.

A prominent vessel owner of Detroit says the committee on aids to navigation is the most important committee of the Lake Carriers' Association, and that on this line the association is doing its best work. Slipping off to another subject he said: "as illustrating the slipshod way in which lake improvements were carried on years ago, I may cite the building of the canal at the St. Clair flats. This canal improvement was brought about by the powerful influence of Zach Chandler at Washington, though Chandler had no hand in its location. Instead, that matter was left to the United States engineers, and they located and built it without so much as consulting one of the men who then owned and operated vessels on the lakes, and made it too narrow. The result is that the mouth of the canal shallows up every winter with the sand which is torn away from the sides of the St. Clair River by the rolling underground ice and carried down by the current. It not only shoals up the mouth of the canal, but washes down a considerable distance into the canal." He says that were it not for the wheels of the deep draft boats this shoal would cost the government many thousands of dollars every year in dredging. Not only this, but it is too narrow for even safe navigation, as was demonstrated last week.

This owner thinks that the west pier of the canal should be moved 300 feet to the westward, which would give a total width of about 450 feet. The current then, instead of sifting the sand into the mouth of the canal, would the more evenly distribute it, and while the canal would undoubtedly catch a part of it the greater portion of the obstruction would pass by on the outside. He continued:

"Not a light or buoy or a lightship or a canal is now established unless the Lake Carriers' Association has had a hand in the matter. The association sends its special committee to Washington, and the departments there have learned by experience to respect and listen to it and follow its advice. It is safe to say that very little money is now spent extravagantly in the improvements of the navigable waters of the lakes. Furthermore, if our improvements are to be in any way permanent, wharves, docks, piers and breakwaters should be built of concrete, otherwise, the general government will get tired and utterly disgusted in voting supplies to do the same work over and over again, as is now the custom with so much timber work and pile driving now being done. The work at Chicago, Buffalo and Cleveland, especially the latter port, is a disgrace to any government, and while the piers and breakwaters were no doubt all right in their designing, the construction was hardly worthy of the most unenlightened country in the world, and certainly no fitting work for the United States to undertake."

SEA water has been converted into a beverage. A little citric acid precipitates chloride of silver, and a harmless mineral water results. Seven ounces of citrate will furnish a shipwrecked man with water for a week.

THE British steel ship Earl of Dunmore, arrived at New York, just before midnight Wednesday, just in time to save a charter for a general cargo to Melbourne, at a freight much better than rates now ruling. A tug was sent 125 miles to meet her.

SEEING SIXTY MILES.

The lake survey parties under Assistant Engineers Haskell and Russell have recently measured some angles of the triangulation, which involved seeing across Lake Superior from Gargantua to Crisp's Point, a distance of over 60 miles. At Gargantua the old station to which connection had to be made was about 410 feet, and at Crisp's Point the station was about 280 feet above the lake. At Crisp's Point an observing station 100 feet high was built, but owing to the curvature of the earth a straight line from the top of it to Gargantua would still pass under the water in the middle of the lake. It was known, however, that the atmospheric refraction sometimes becomes excessive, especially on Lake Superior, and both stations were occupied with the hope that these extraordinary conditions would occur and permit the line between the two stations to be seen across. Accordingly, Mr. Haskell's party occupied the station at Gargantua, and Mr. Russell's party occupied that at Crisp's Point.

For two weeks the necessary conditions were patiently waited for, but finally the smoke cleared away, and the sun came out so that the mirrors at each station that were used to flash light from one to the other, could be brought into play. The sun flash was finally seen and the angles were soon measured.

The sun flash as seen at one station from the other presented numerous peculiarities. It would sometimes appear single, then would split up into three, four and even five different flashes—one over the other in a vertical line. Sometimes the flashes would appear white, at others they would take the different colors of the rainbow.

DIXON'S GRAPHITE PIPE-JOINT COMPOUND.

Twelve or fifteen years ago this article was known under the name of "Smear Grease," and later was changed to "Pipe-Joint Grease." It really is not a grease, and as the name has caused some misunderstanding, the Dixon Co. have decided to change it, and it hereafter will be known as "Dixon's Graphite Pipe-Joint Compound." This Compound, under one or the other of its several names, has been in the market for about twenty years. It is not only useful for joints and all steam, gas and water piping but is equally useful for smearing gaskets and flange-joints of meters, traps and for bolts, screws, etc. In the mills, mines and factories of the Dixon Co., this compound has been used in preference to any other article. It is infinitely superior both in usefulness and economy to red lead, and the Dixon Co. recommend it as such with the fullest degree of certainty. This Graphite Pipe-Joint Compound is manufactured by the Joseph Dixon Crucible Co., Jersey City, N. J.

TRADE NOTES.

Bell's Steam Engine Works, Buffalo, advertise for sale a handsome steam yacht, 54 x 10 x 5, a cut of which appears in this issue.

The American Elevator and Grain Trade publishes, in its issue of July 15, an interesting article on the earlier days of Chicago's grain trade which is partially a reprint of an article published in the Chicago Magazine of May, 1857.

The Morison suspension furnaces for steam boilers are rapidly working themselves into popular favor. The Continental Iron Works, of Brooklyn, N. Y., the manufacturers, have recently furnished an equipment for the steamer Pennland of the Red Star Line, and the Paris is to be fitted out with them also.

The Johnson Iron Works (Limited) of New Orleans, writes as follows to Mr. H. G. Trout, of Buffalo, in care of the King Iron Works: "The engineer of the S. S. Wilson, reports that the wheel now in use on the steamer, which is of the Trout make, gives as good results as the old wheel in fair weather, and better against a head sea. It is easier on the engine than the old wheel. The feed claimed now with the new wheel is 11 knots per hour. The captain of the Wilson corroborates the report of the engineer."

The beauties of the automatic steam towing machine, manufactured by the American Ship Windlass Co., Providence, R. I., are being so well appreciated by all who see and use them that there will in a short time be four in use on the lakes and four on the Atlantic Coast, practically illustrating the satisfaction and safety that they afford. Besides this it is now proposed to try them more extensively for the towing of oil tank barges, and if successful in this line, as no doubt they will be, it may mean a revolution in this character of freight business.

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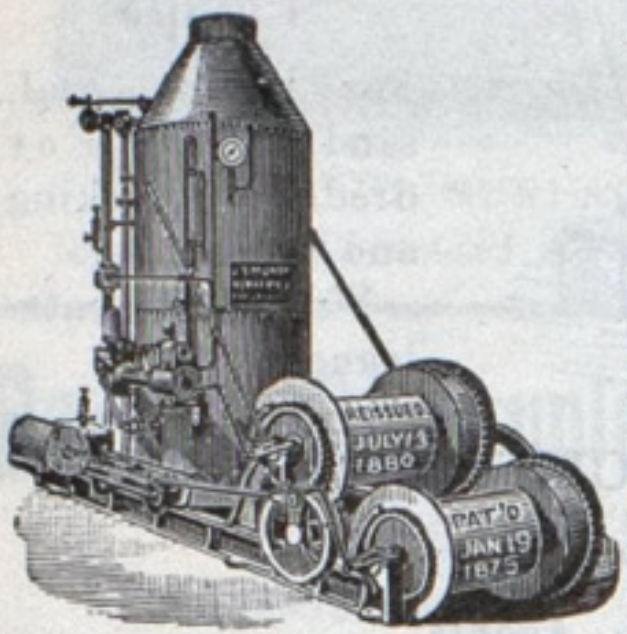
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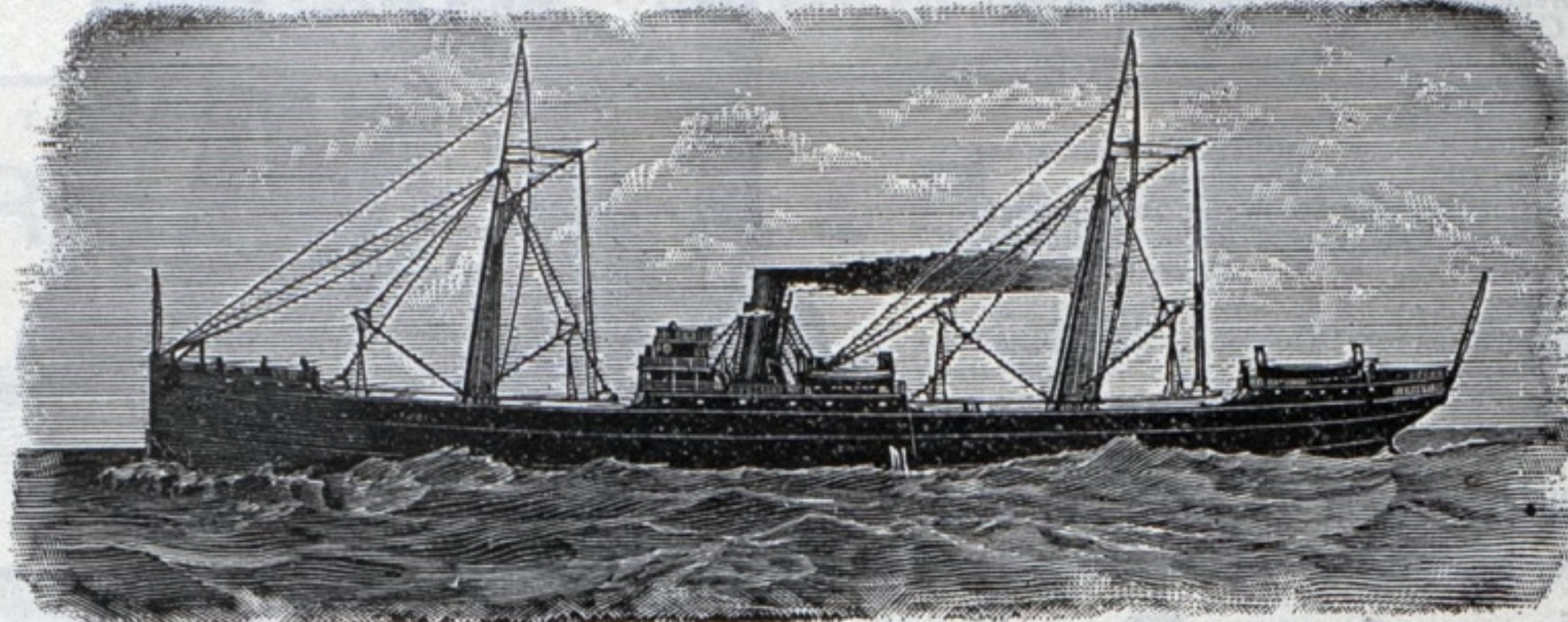
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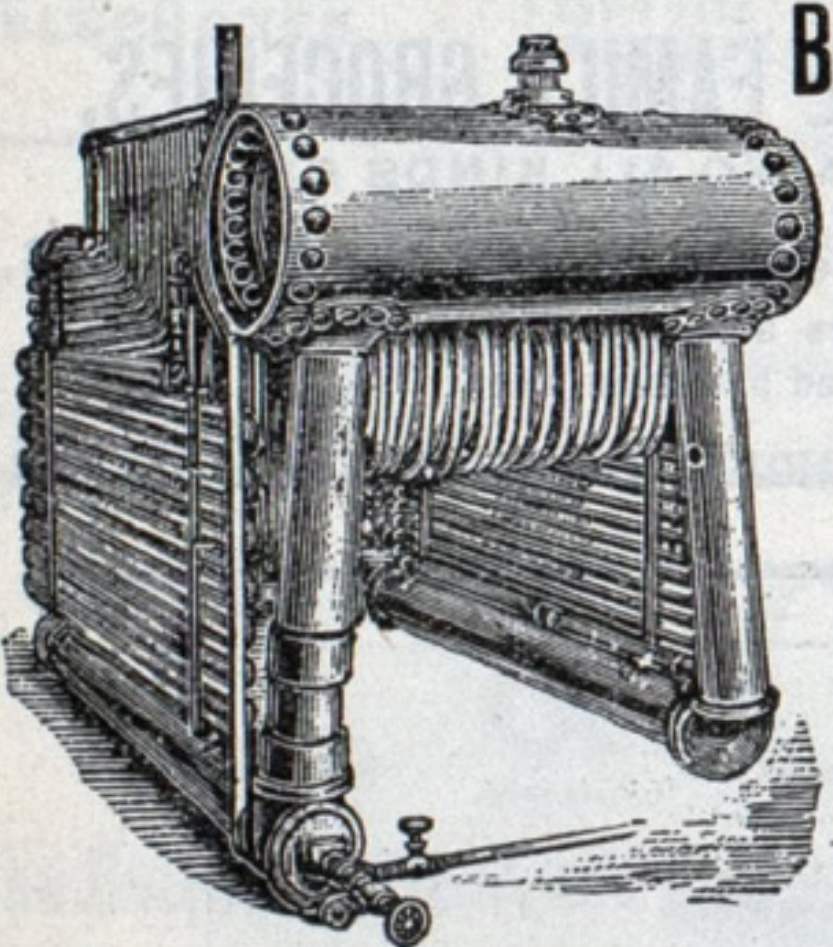
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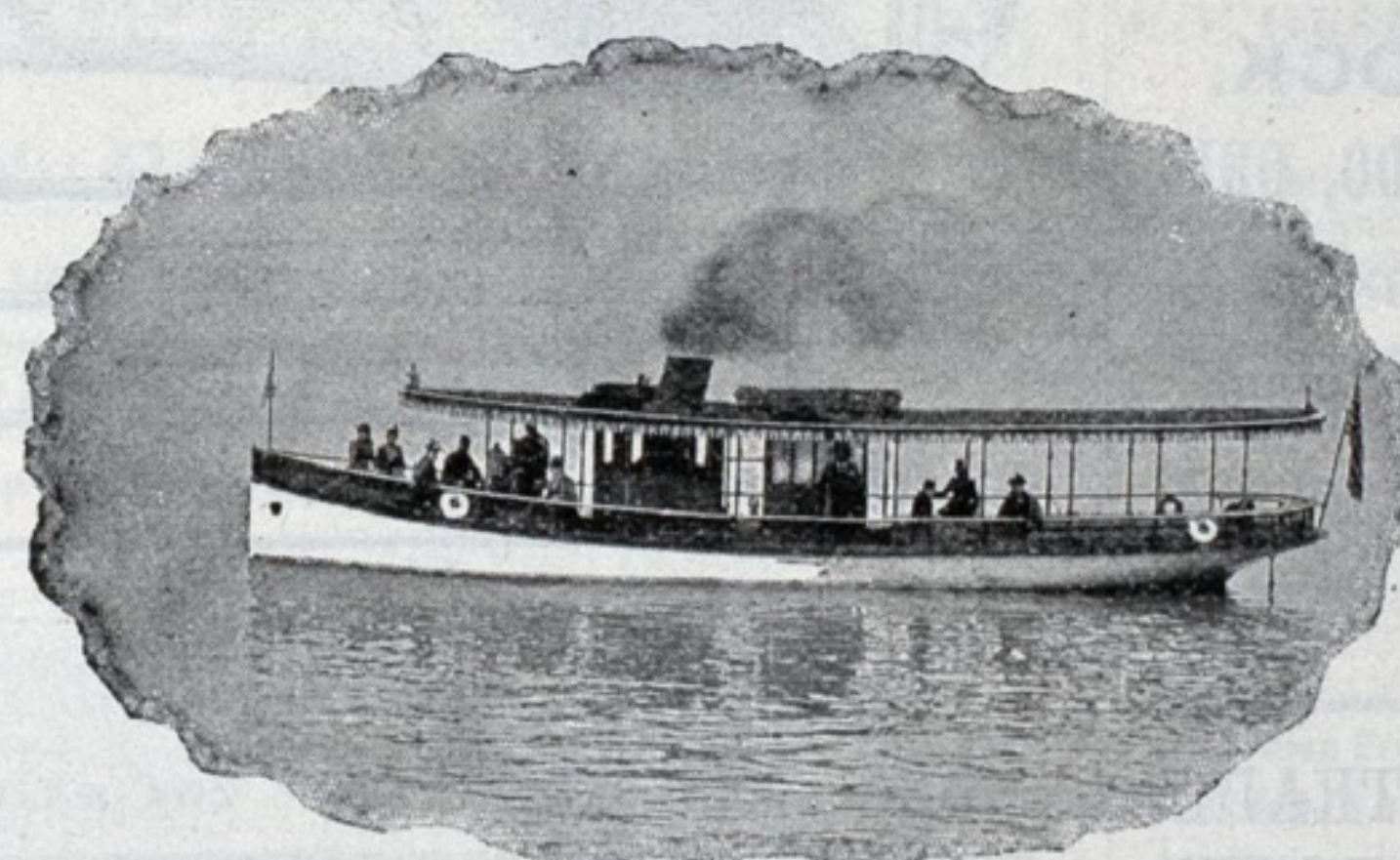
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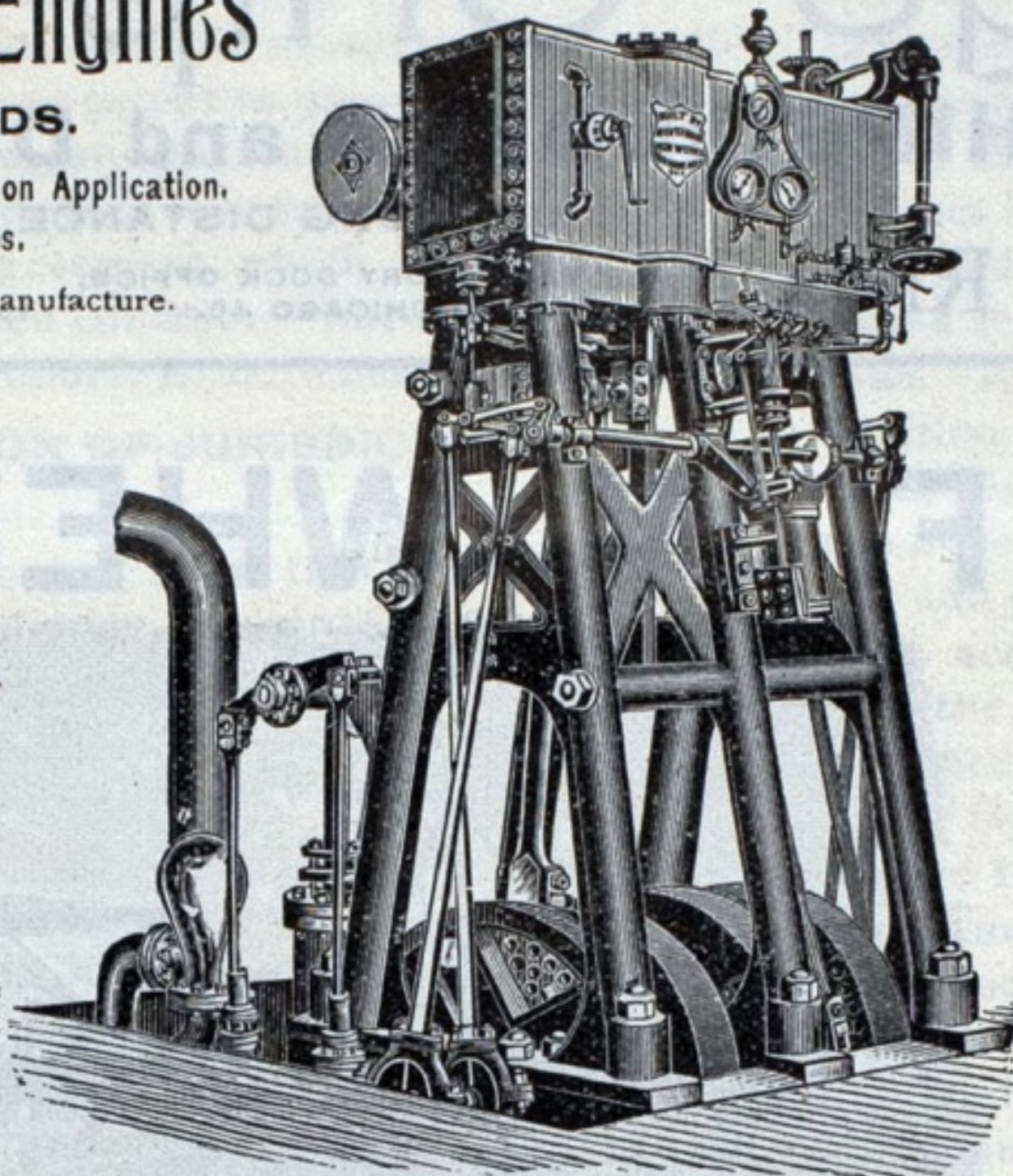
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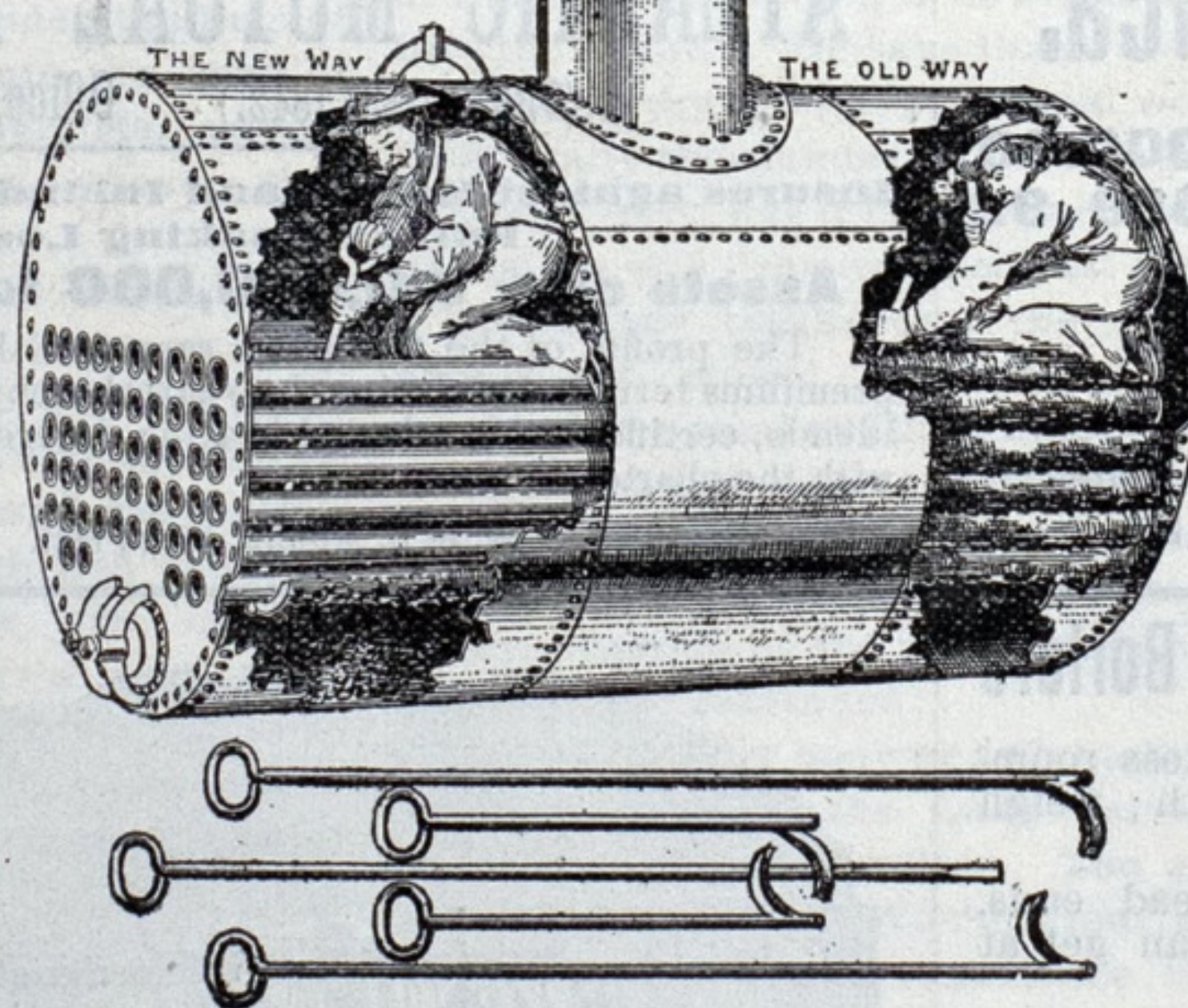
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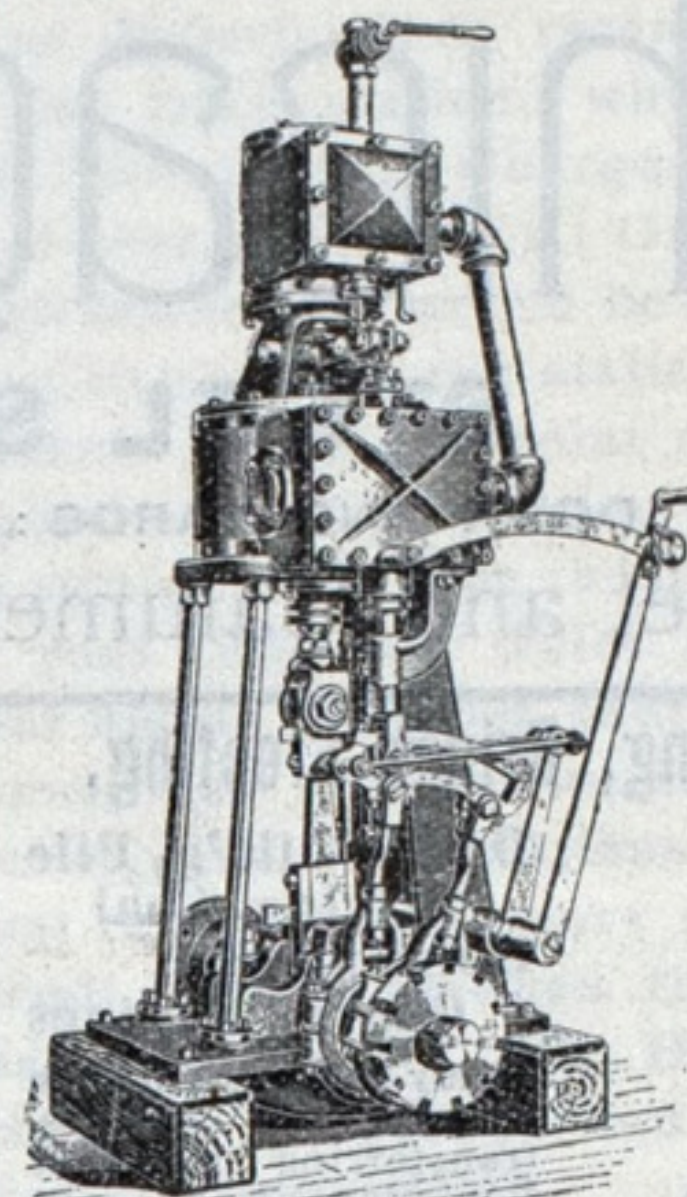
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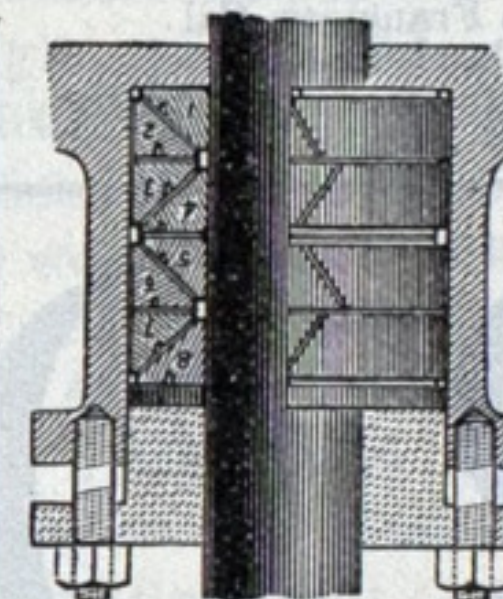
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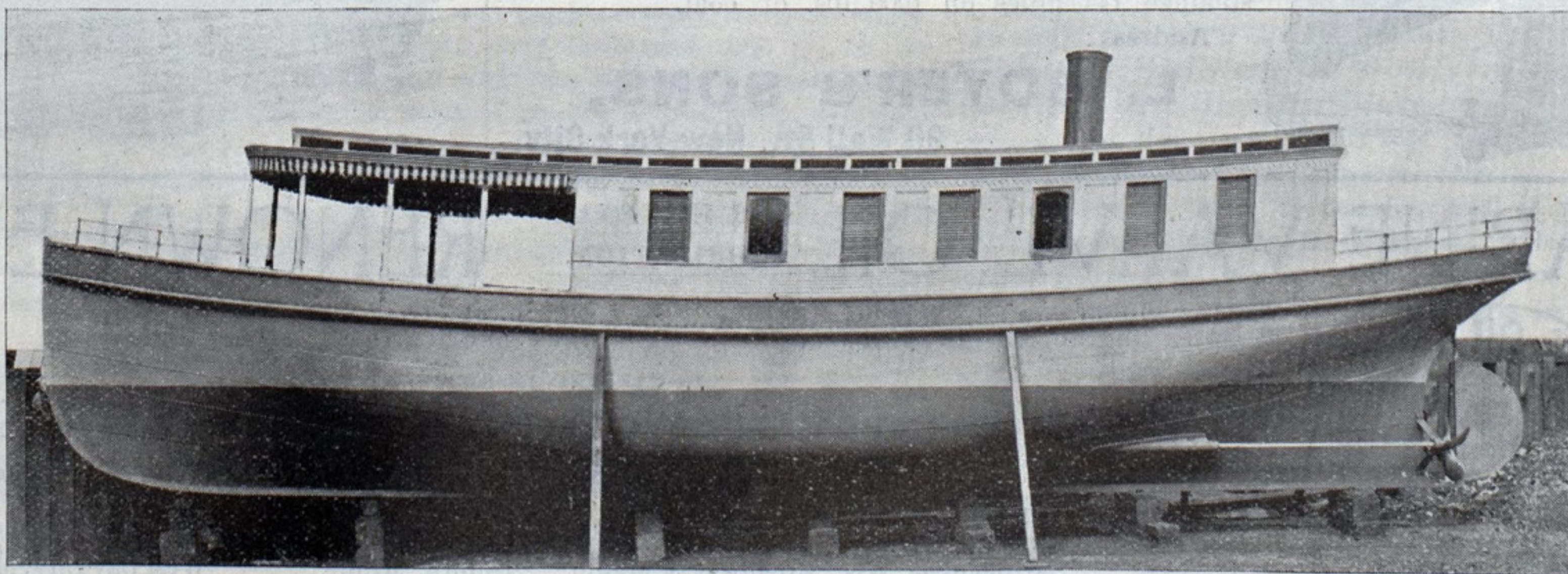
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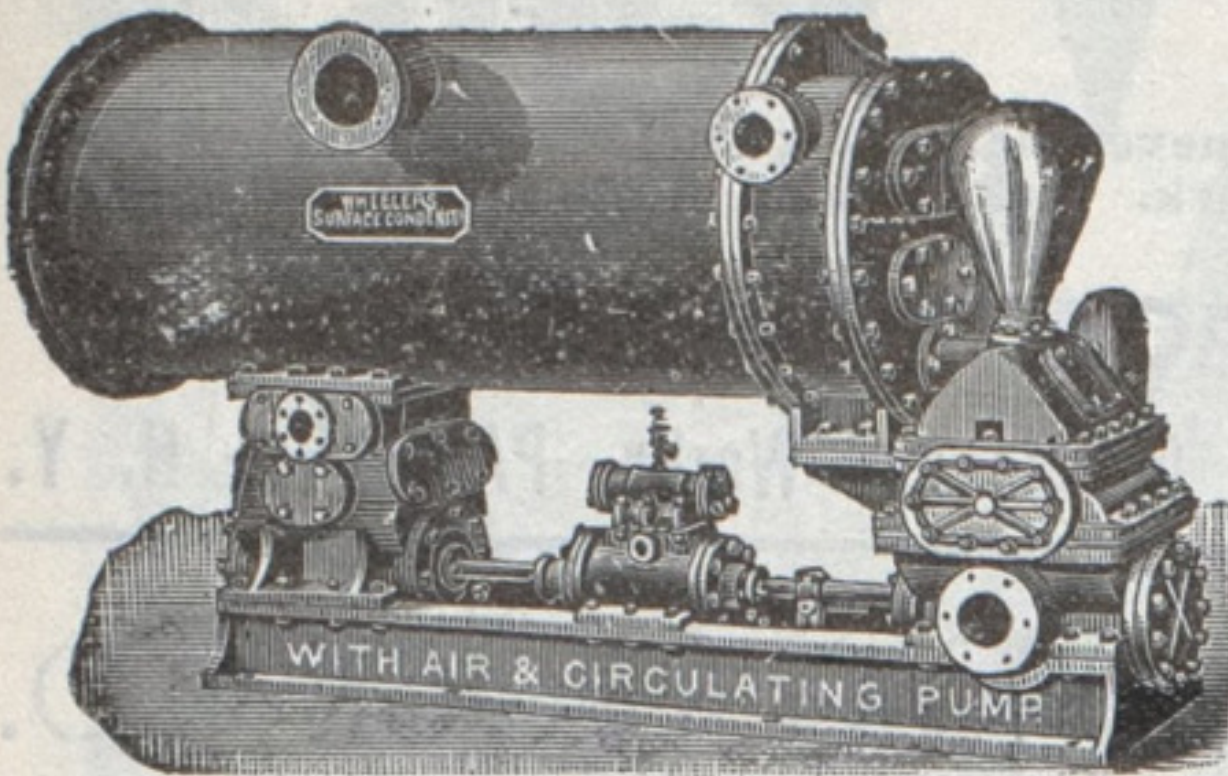
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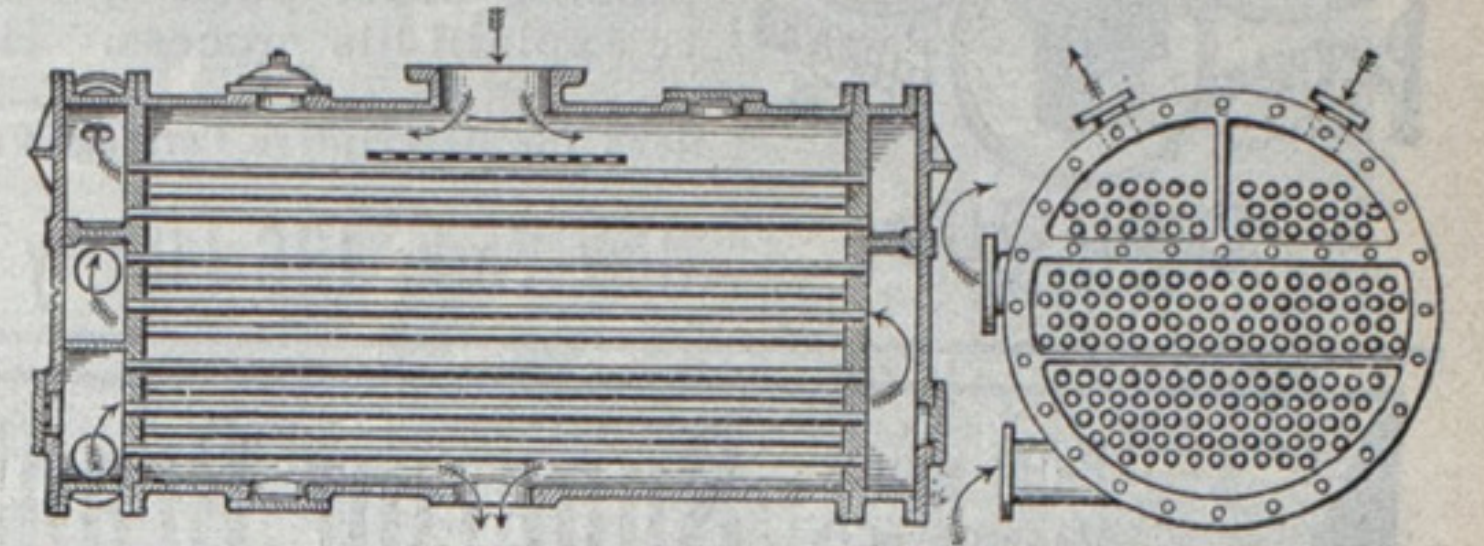
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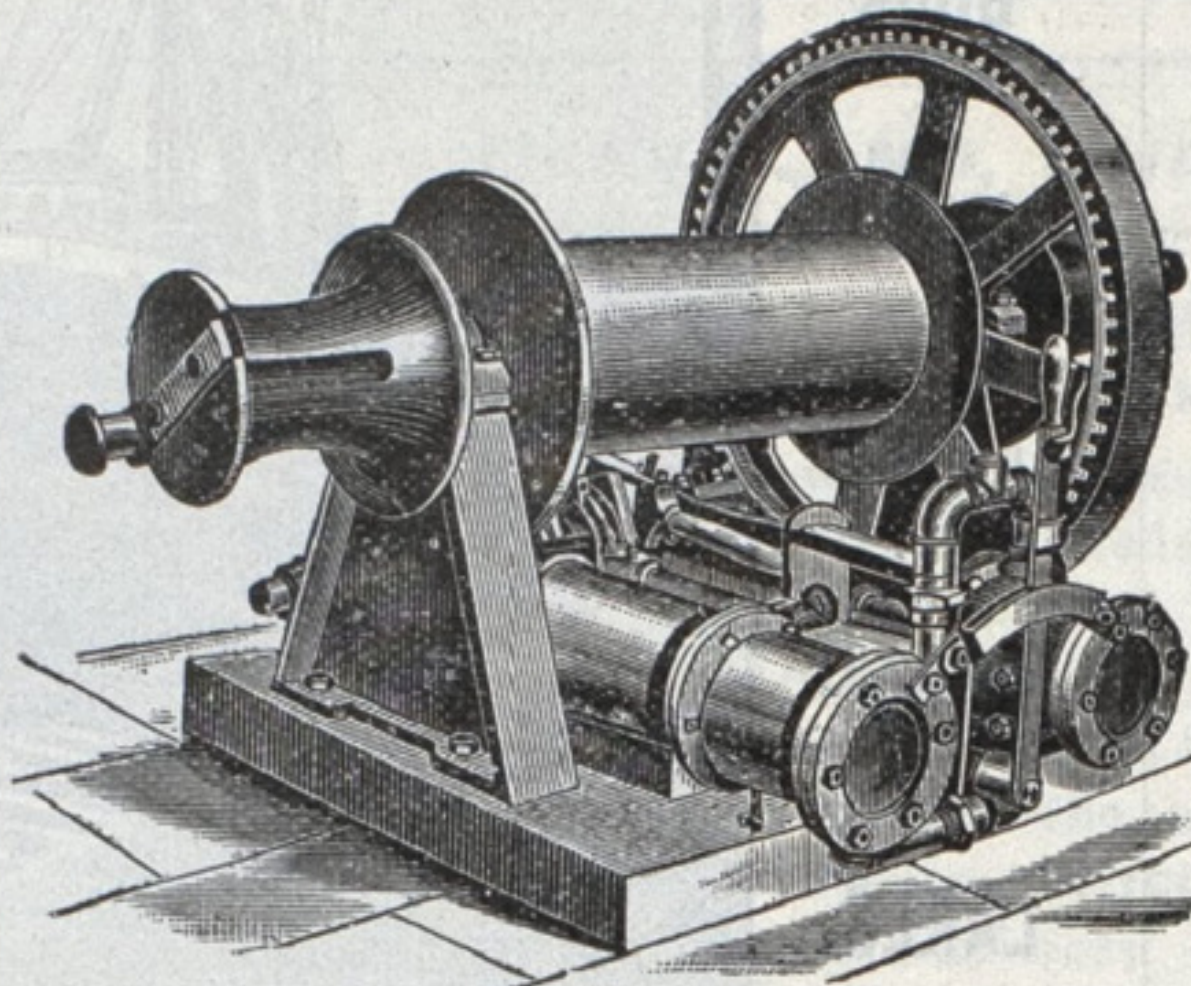
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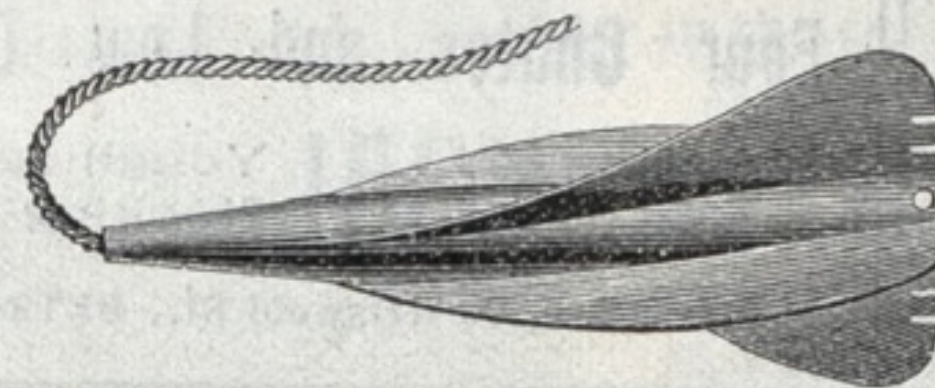
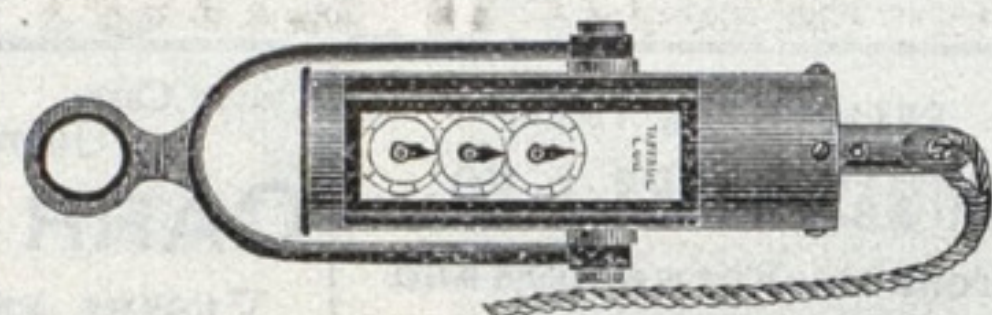
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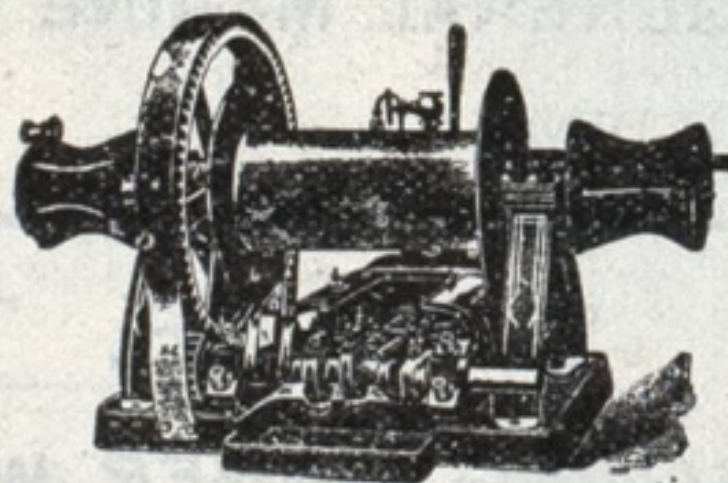
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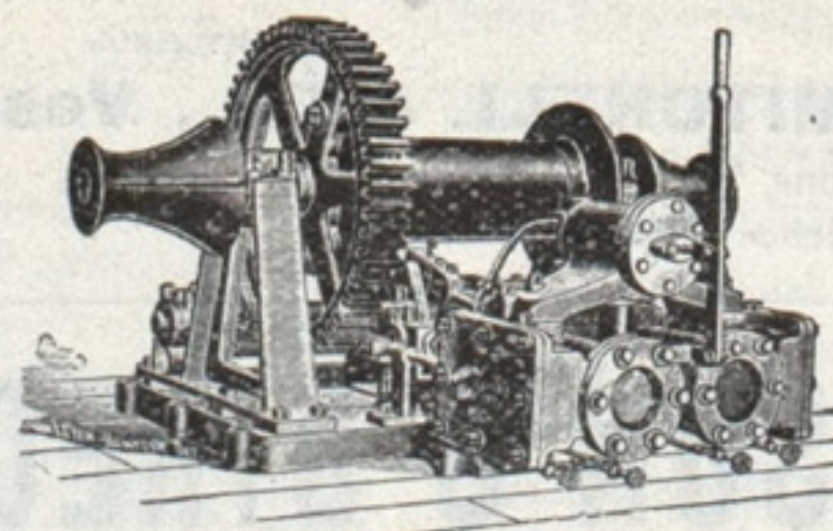
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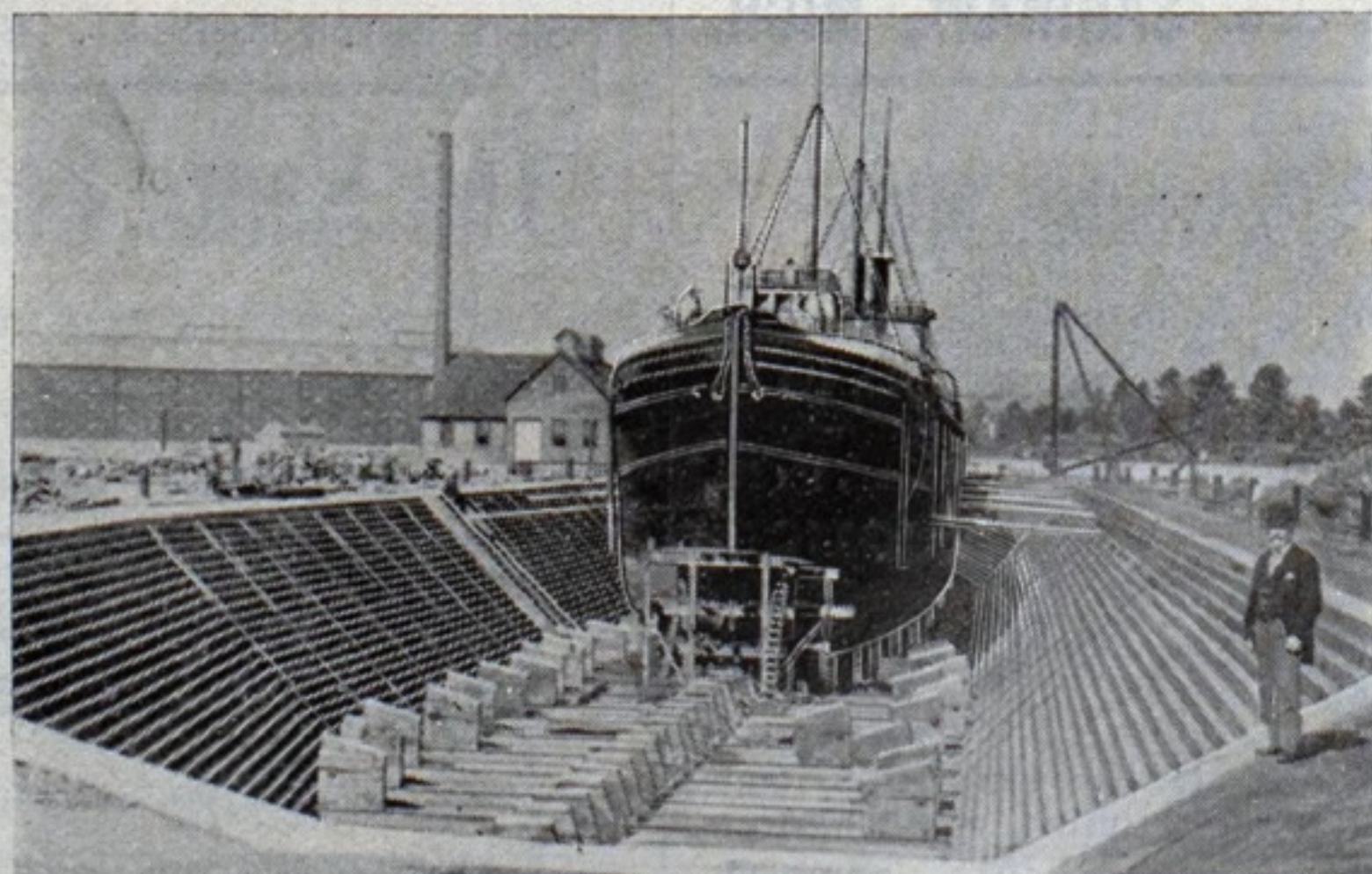
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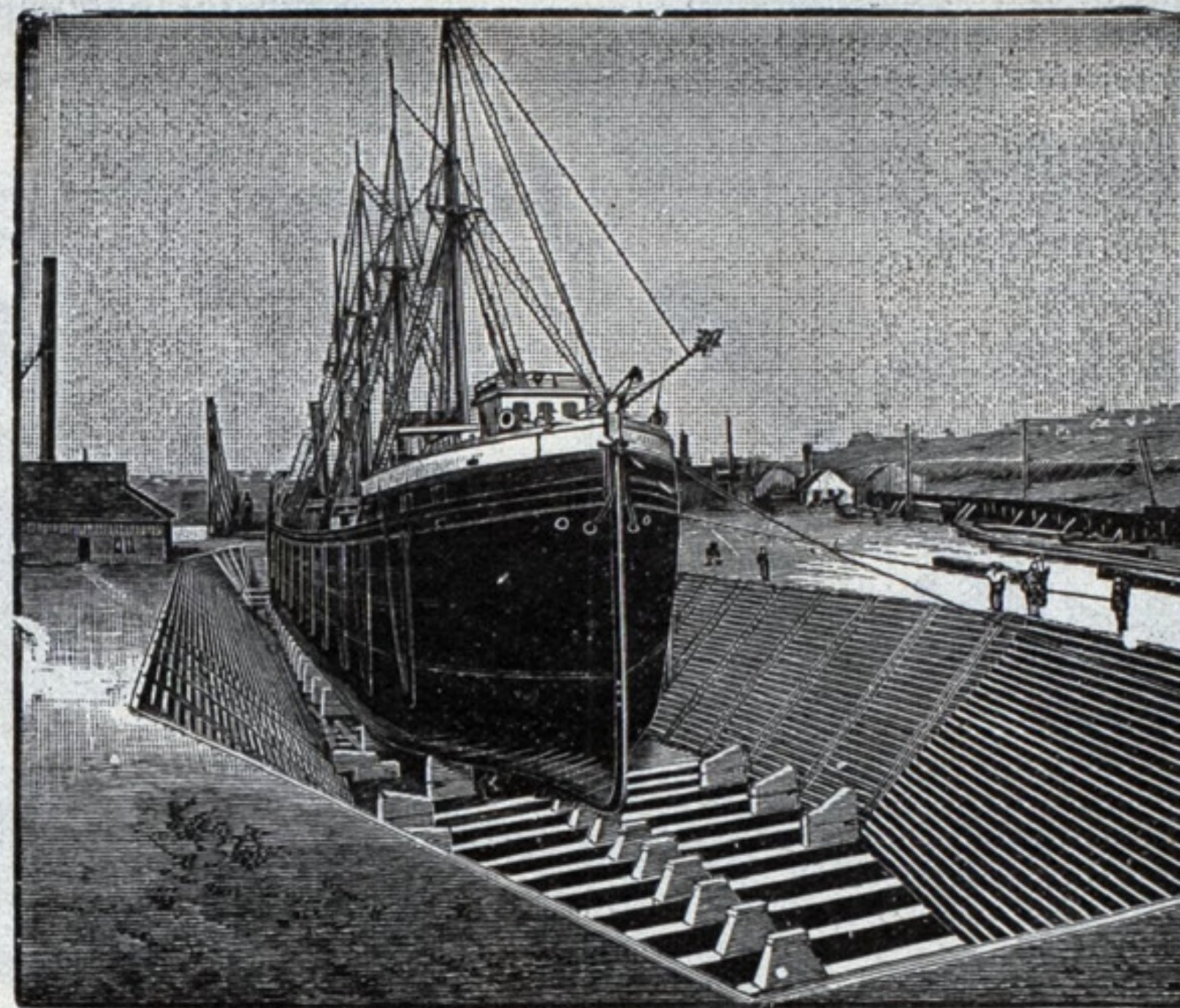
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